

CITY OF HOLLY HILL, FLORIDA

CITY COMMISSION

AGENDA • MAY 12, 2020

City Commission Chamber

Regular City Commission Meeting

7:00 PM

CITY HALL
1065 RIDGEWOOD AVENUE
HOLLY HILL, FL 32117

City Clerk's office: (386) 248-9441 - Fax: (386) 248-9448



City Commission Chamber
City Hall
1065 Ridgewood Avenue
Holly Hill, FL 32117

CITY COMMISSION MEMBERS

Mayor
Chris Via

District 1 - Commissioner
John Penny

District 3 - Commissioner
John C. Danio

District 2 - Commissioner
Penny Currie

District 4 - Commissioner
Roy Johnson

CITY MANAGER
Joseph Forte

CITY CLERK
Valerie Manning

1. CALL TO ORDER

- a. Roll Call
- b. Invocation by Mayor Chris Via
- c. Pledge of Allegiance

2. RECESS THE CC MTG & CONVENE AS THE CRA**3. CRA AGENDA ITEM**

- 1. -2020-R-20 A Resolution of the Community Redevelopment Agency (Cra) of the City of Holly Hill, Florida, Approving Change Order #4 to the Us1 Utility Underground Project to Carter Electric and Waiving of Formal Bidding and Authorizing the City Manager to Execute the Change Order for an Amount Not to Exceed \$39,149.13 and 365 Additional Days

(Requested by Antoine Khoury, Public Works)

4. ADJOURN AS THE CRA & RECONVENE THE CC MTG**5. PUBLIC COMMENTS****6. APPROVAL OF MINUTES**

- 1. Minutes - April 28, 2020, Regular City Commission Meeting

(Requested by Valerie Manning, City Clerk)

7. CONSENT AGENDA - ITEMS (1 - 2)

The action proposed is stated for each item on the Consent Agenda. Unless a City Commissioner removes an item from the Consent Agenda, no discussion on individual items will occur and a single motion will approve all items. Is there anyone in the audience who wishes to speak on any item on the Consent Agenda?

- 1. Resolution -2020-R-21 A Resolution of the City Commission of the City of Holly Hill, Florida, to Award the Bid for the "Rehabilitation of Lift Station #9 (CDBG)" to Cain Enterprises, Dba Engineering Solutions International, (ESI), as the Lowest Responsible Bidder and Approve the Contract in the Amount of \$249,999.00; Providing for Severability; and Providing for an Effective Date.

(Requested by Antoine Khoury, Public Works)

- 2. Resolution -2020-R-22 A Resolution of the City Commission of the City of Holly Hill, Florida, Adopting the Updated Volusia County Local Mitigation Strategy; and Providing for Severability; and Providing for an Effective Date.

(Requested by Antoine Khoury, Public Works)

8. REGULAR AGENDA

1. Resolution -2020-R-23 A Resolution of the City Commission of the City of Holly Hill, Florida, Authorizing Change Order #4 to the US1 Utility Underground Project to Carter Electric and Authorizing the City Manager to Execute the Change Order for an Amount Not to Exceed \$39, 149.13 and 365 Days for Final; Providing for Severability; and Providing for an Effective Date.

(Requested by Valerie Manning, City Clerk)

2. Resolution -2020-R-24 A Resolution of the City Commission of the City of Holly Hill, Florida, Approving a Proportionate Fair Share Agreement with Fountainhead Developers, LLC, for the Development Located at 1200 Center Avenue, Holly Hill, Florida; Providing for Severability; Providing for Conflicting Resolution; and Providing for an Effective Date.

(Requested by Joseph Forte, City Manager)

9. PUBLIC HEARINGS

Please silence any cell phone, pager or noise making device as not to interrupt the meeting. Staff will introduce each item for consideration, with comments and recommendations. The applicant or appellant and supporters will be heard first. Those in opposition to the request will be heard next. Comments should be restricted to pertinent information regarding the agenda item under discussion. Out of courtesy to others, we ask that speakers keep their comments brief and try to limit these comments to information not previously discussed. Speakers should state their name and address clearly for the record. The City Clerk's office is required to retain any documents, photographs, drawings, etc. that are shown to the City Commissioners in support of a position. The City Commission may ask questions of speakers or of staff members. The Mayor will then ask the City Commission to make a recommendation or motion. Once a motion has been made and seconded, discussion will be closed to the floor. Following City Commission discussion, a vote will be taken. During voting, Commissioners who do not cast objecting votes are considered to have voted in support of the motion.

1. Ordinance -2020-O-3026 1541 Garden Avenue - an Ordinance of the City of Holly Hill, Florida Amending, the Land Development Regulations, by Amending the Official Zoning Map to Designate the Property Described in Exhibit a from R-3 (Medium Density Single Family Residential) to Cc-1 (Commercial Corridor District); Providing for Conflicting Ordinances; Providing for Severability; and Providing an Effective Date.

(Requested by Brian Walker, City Planner)

2. 1730 Birmingham Avenue - Request for a Side Yard (North) Setback Variance from Eight (8) Feet to Zero (0) Feet, and a Rear Yard Setback Variance from Twenty (20) Feet to Eight (8) Feet, in Order to Build a Two Car Garage, an Attached Carport Structure, and a Covered Porch.

(Requested by Brian Walker, City Planner)

10. COMMUNICATIONS

- A. City Manager & Staff Comments
- B. City Attorney Comments
- C. City Commission Comments
- D. Mayor's Comments

11. ADJOURNMENT

Website Address – www.hollyhillfl.org (City Clerk)

NOTICE – If any person decides to appeal any decision of the City Commission at this meeting, he/she will need a record of the proceedings and, for that purpose, he/she may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based. The City does not prepare or provide such a record.



For special accommodations, please notify the City Clerk's Office at least 72 hours in advance. (386) 248-9441



Help for the hearing impaired is available through the Assistive Listening System. Receivers can be obtained from the City Clerk's Office.

In accordance with the Americans with Disabilities Act (ADA), persons needing a special accommodation to participate in the Commission proceedings should contact the City Clerk's Office no later than three (3) days prior to the proceedings.



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
CRA Resolution**

3.1

MEETING DATE: May 12, 2020
FROM: Antoine Khoury
SUBJECT: A Resolution of the Community Redevelopment Agency (Cra) of the City of Holly Hill, Florida, Approving Change Order #4 to the Us1 Utility Underground Project to Carter Electric and Waiving of Formal Bidding and Authorizing the City Manager to Execute the Change Order for an Amount Not to Exceed \$39,149.13 and 365 Additional Days
NUMBER: 2020-R-20
APPLICANT:
PLANNER:

DISCUSSION:

On March 17, 2017, the contract for the burying of overhead utilities underground on US1 from Mason Avenue to Walker Street was awarded to Carter Electric Co., Inc., Daytona Beach, FL. Additional work is required to complete the undergrounding project. The scope of this work was not included in the original contract as it was planned to be completed later in the project.

Due to further coordination with Florida Power & Light (FPL) in regards to additional bollards to protect their equipment, a remainder of As-built work needed for completion of project, and a Post Construction video. These items will result in a \$6,576.40 overrun of the current contract value.

Additional work is necessary for the completion of the project due to FPL modifying the design and includes:

1. Rework of FPL conduit at revised pole locations - The undergrounding includes the transition from above ground to underground FPL facilities on the various side streets. FPL installed several new poles in these locations to accommodate the transitions. Due to field conditions, some of the poles were installed in different locations than originally planned for during the initial installation of the conduit. The revised pole locations require the rework of the conduit. This additional cost for this will result in a \$25,232.73 increase to the contract.
2. Additional survey services - Additional surveying services are required to complete the project. The City requested the Contractor to utilize his survey subcontractor to prepare four legal descriptions and sketches for easements that had not been acquired previously. FPL required specific as-built sketches for all of the equipment to verify the location of such within the easements and staking of the easements in the field were necessary for FPL field review. The cost of these additional services are

\$7,340.00.

The increase in the contract price as a result of this change order is \$39,149.13.

This contract has been purposely kept active to allow for the completion of the remaining work and additional work that may be necessary. As additional 365 days will allow the contract to extend until July 11, 2020. All work necessary for the utility companies to finish their undergrounding work is expected to be completed by that day.

FISCAL ANALYSIS:

This project is funded in account 139-8110-580.6300. There are sufficient budget funds remaining to fund this request.

STAFF RECOMMENDATION:

City staff and our consultant have reviewed these cost proposals and found them reasonable and fair. Much of the work/pricing are extensions of existing contract unit pricing and quantities. The remaining work is in line with the Engineer's estimate for that work.

COMMISSION GOALS:

Goal #1: Develop and maintain a sound and sustainable financial plan for the city that establishes sufficient reserves for all funds, ensures (whenever possible) that user fees pay for services rendered, provides a realistic capital improvement program, and encourages public/private sector partnerships and intergovernmental partnerships.

Goal #2: Enhance City aesthetics through beautification and maintenance of city property and public rights of way, consistent enforcement of zoning and property maintenance codes, and development of reasonable design standards and a corresponding process which is applicable to all new developments and business improvements in the city.

Goal #3: Implement the CRA master plan with a focus on the best utilization of vacant properties and blighted properties in the city. Attention should also focus on infrastructure improvements within the district and strategies to encourage private investment and business retention.

MOTION:

APPROVE AUTHORIZING CHANGE ORDER #4 TO THE US1 UTILITY UNDERGROUND PROJECT TO CARTER ELECTRIC AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE CHANGE ORDER FOR AN AMOUNT NOT TO EXCEED \$39,149.13 AND AN ADDITIONAL 365 DAYS AND WAIVING OF FORMAL BIDDING ALLOWING THE CONTRACT EXTENSION UNTIL JULY 11, 2020.

ATTACHMENTS:

- Change Order #4 (PDF)

CRA Resolution No. 2020-20

A RESOLUTION OF THE COMMUNITY REDEVELOPMENT AGENCY (CRA) OF THE CITY OF HOLLY HILL, FLORIDA, APPROVING CHANGE ORDER #4 TO THE US1 UTILITY UNDERGROUND PROJECT TO CARTER ELECTRIC AND WAIVING OF FORMAL BIDDING AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE CHANGE ORDER FOR AN AMOUNT NOT TO EXCEED \$39,149.13 AND 365 ADDITIONAL DAYS

A RESOLUTION OF THE COMMUNITY REDEVELOPMENT AGENCY (CRA) OF THE CITY OF HOLLY HILL, FLORIDA, APPROVING CHANGE ORDER #4 TO THE US1 UTILITY UNDERGROUND PROJECT TO CARTER ELECTRIC AND WAIVING OF FORMAL BIDDING AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE CHANGE ORDER FOR AN AMOUNT NOT TO EXCEED \$39,149.13 AND 365 ADDITIONAL DAYS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Community Redevelopment Agency (CRA) of the City of Holly Hill has taken steps to move forward the burying of overhead utilities underground having completed the Secondary Phase of the work; and

WHEREAS, on March 17, 2017, the City has awarded the contract to perform the burying of overhead utilities underground in accordance with Bid #13 ST 03 Phase III to Carter Electric; and

WHEREAS, additional work is required to add additional bollards, remainder of As-builts, post construction video, re-work of FPL conduit at revised pole locations, and additional survey services; and

WHEREAS, additional time has also been requested by Contractor for the additional work described above and other issues that have occurred during construction.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMUNITY REDEVELOPMENT AGENCY (CRA) OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. That the Community Redevelopment Agency (CRA) of the City of Holly Hill does hereby authorize the City Manager to execute a change order with Carter Electric for an amount not to exceed \$39,149.13 and 365 additional days extending the contract completion to July 11, 2020.

SECTION 2. SEVERABILITY. If any section or portion of a section of this

Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 3. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020.

CHANGE ORDER FORM

PROJECT: *US-1 Utility Undergrounding Primaries Conversion*
 BID: *113-ST-03 Phase III*

CHANGE ORDER NO. 4

CONTRACTOR: Carter Electric Company, Inc.

The following changes are hereby made to the Contract Documents:

CHANGE IN CONTRACT PRICE: Original Contract Price: <u>\$ 2,697,130.82</u>	CHANGE IN CONTRACT TIMES: Original Contract Times: Substantial Completion: <u>June 2, 2018</u> Final Completion: <u>July 2, 2018</u>
Net changes from previous Change Orders: <u>\$ 186,543.34</u>	Changes in contract time from previous Change Orders: 247 Days
Contract Price prior to this Change Order: <u>\$ 2,883,665.16</u>	Contract Completion Date prior to this Change Order: Substantial Completion: <u>March 14, 2019</u> Final Completion: <u>July 12, 2019</u>
Net Increase (decrease) of this Change Order: <u>\$ 39,149.13</u>	Changes in contract time requested this Change Order Substantial Completion: N/A Final Completion: +365 days
Contract Price with all approved Change Orders: <u>\$2,922,814.29</u>	Contract Times with all approved Change Orders: Substantial Completion: <u>N/A</u> Final Completion: <u>July 11, 2020</u>

CHANGES ORDERED:

- I. GENERAL – This change order is necessary to cover changes in the work to be performed under this Contract. The General Conditions, Supplementary Conditions, Specifications and all parts of the Project Manual listed in Article 1, Definitions, of the General Conditions apply to and govern all work under this change order.

The change in price and/or delivery date described, is considered to be fair and reasonable and has been mutually agreed upon in full agreement and final settlement of all claims arising out of the modification including all claims for delays and disruptions resulting from, caused by, or incident to such modifications and change orders.

II. REQUIRED CHANGES:

CONTRACT PRICE: The contract price is hereby increased by \$39,149.13.

CONTRACT TIME: The contract time is hereby increased by 365 days for Final.

III. JUSTIFICATION:**CONTRACT PRICE:**

As of approved Pay Application #25 dated through 3/31/20 the balance of the current billable amount is \$145.95. The actual amount of remaining work exceeds this amount due to:

- Additional bollards requested by FPL to protect their equipment
- Remainder of As-built work needed for completion of project
- Post Construction video

These items will result in a \$6,576.40 overrun of the current contract value.

Additional work not included in the original scope of the contract is necessary for the completion of the project including:

1. Rework of FPL conduit at revised pole locations – The undergrounding includes the transition from above ground to underground FPL facilities on the various side streets. FPL installed several new poles in these locations to accommodate the transitions. Due to field conditions, some of the poles were installed in different locations than originally planned for during the initial installation of the conduit. The revised pole locations require the rework of the conduit. See attached \$25,232.73 proposed change order from the Contractor dated 3/10/20.

2. Additional survey services – Additional surveying services are required to complete the project. The City requested the Contractor to utilize his survey subcontractor to prepare four legal descriptions and sketches for easements that had not been acquired previously. FPL required specific as-built sketches for all of the equipment to verify the location of such within the easements and staking of the easements in the field were necessary for FPL field review. The cost of these additional services are \$7,340.00.

CONTRACT TIME:

This contract has been purposely kept active to allow for the completion of the remaining work and additional work that may be necessary. An additional 365 days will allow the contract to extend until July 11, 2020. All work necessary for the utility companies to finish their undergrounding work is expected to be completed by that day.

- IV. PAYMENT: Payment for the additional work will be paid for upon completion of the additional work per the Contract. The contract retainage will be maintained at \$5,000.00 until all work is completed.

Acknowledgments:

The aforementioned change, and work affected thereby, is subject to all provisions of the original contract not specifically changed by this Change Order;

It is expressly understood and agreed that the approval of the Change Order shall have no effect on the original contract other than matters expressly provided herein;

The prices quoted are fair and reasonable and in proper ratio to the cost of the original work contracted for under competitive bidding; and,

The change in price and/or delivery date described is considered to be fair and reasonable and has been mutually agreed upon in full agreement and final settlement of all claims arising out of this modification including all claims for delays and disruptions resulting from, caused by, or incident to such modifications and change orders.

RECOMMENDED BY:

Mead & Hunt
(Engineer)

By:  4/15/20
(Authorized Signature) (Date)

David King, P.E.,
Name Typed

APPROVED BY:

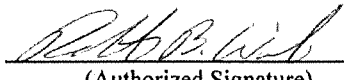
City of Holly Hill
Owner

By: _____
(Authorized Signature) (Date)

Joseph A. Forte, City Manager
Name Typed

ACCEPTED BY:

Carter Electric Company, Inc.
(Contractor)

 4-15-2020
(Authorized Signature) (Date)

Robert B. Wiech
Name Typed

END OF SECTION



carter electric company, inc. contractors – engineers

231 JEAN STREET • DAYTONA BEACH, FLORIDA 32114-4197

EC0000265
EC0002058

TELEPHONE: 386/255-1418
FAX: 386/255-3429
www.carterelectric.com

PROPOSED CHANGE ORDER

Client Address:

Mead & Hunt
Contact: David King
4401 Eastport Parkway
Port Orange, FL 32127

CCN # 15
Date: 3/10/2020
Project Name: Holly Hill Utility Undergr
Project Number: 1404
Page Number: 1

Work Description

A. REWORK CONDUIT LOCATIONS TO NEWLY INSTALLED FPL POLES

1. FPL pole holding allowance if required, will be credited if not needed
2. Relocation of conduits to new pole locations
3. Asphalt cutting and patching
4. concrete cutting and patching
5. Directional bore 1-6" conduit 100' on the west side of 2nd street
6. Update the surveys and asbuilts
7. Traffic Control

NOTE: THIS ELECTRICAL PROPOSAL IS BASED ON ACTUAL MATERIAL QUANTITIES AS DETAILED BELOW.

B. ITEMS INCLUDED IN PROPOSAL ARE AS FOLLOWS:

1. State sales tax on material and equipment costs.
2. Project Supervision.
3. Rental Equipment Cost.
4. Personal Protective Equipment for our employees.

C. EXCLUDED ITEMS FROM THIS PROPOSAL ARE AS FOLLOWS:

1. Premium time, weekends, holidays, and overtime.

D. TERMS:

1. We reserve the right to correct this quote for errors and omissions.
2. This quote is good for acceptance within 30 days from the date of noted above.
3. We request a time extension of (5) additional days to complete this additional work.

Itemized Breakdown

Description	Qty	Total Mat.	Total Hrs.
2" CONDUIT - PVC40 FPL FURNISHED	100	0.00	0.00
2 x 24" RAD ELBOW 90 DEG - PVC40 FPL FURNISHED	12	0.00	0.00
2" COUPLING - PVC FPL FURNISHED	28	0.00	0.00

ORIGINAL

Attachment: Change Order #4 (2020-R-20 : CRA MTG - OH to UG Primary Relocate Project - Change Order #4)

PROPOSED CHANGE ORDER

Client Address:

Mead & Hunt
 4401 Eastport Parkway
 Port Orange, FL 32127

CCN # 15
Date: 3/10/2020
Project Name: Holly Hill Utility Unde
Project Number: 1404
Page Number: 2

Description	Qty	Total Mat.	Total Hrs.
6" COUPLING - PVC FPL FURNISHED	3	0.00	0.00
REWORK 6-2"@ KRYSTAL	1	0.00	20.00
REWORK 4-4" @ OAKRIDGE	1	0.00	18.00
REWORK 1-6" 2ND STREET EASTSIDE	1	0.00	11.00
REWORK 6-2" 6TH ST EAST SIDE	1	0.00	23.00
REWORK 6-2" 7TH ST EAST SIDE	1	0.00	25.00
REWORK 6-2" 8TH ST WEST SIDE	1	0.00	24.00
REWORK 1-6" 6TH ST WEST SIDE	1	0.00	24.00
REWORK 1-6" 2ND ST WEST SIDE	1	0.00	13.00
Totals	151	0.00	158.00

Summary

Direct Labor		10,388.50
TRAFFIC CONTROL (1.00 @ 8.00 @ \$250.00 + 0.000 % + 0.000 % + 0.000 %)		2,000.00
FPL POLE HOLDING FEES (1.00 @ 1.00 @ \$2,500.00 + 0.000 % + 0.000 % + 0.000 %)		2,500.00
ASBUILT SURVEY REVISIONS (1.00 @ 8.00 @ \$600.00 + 0.000 % + 0.000 % + 0.000 %)		4,800.00
DUMP FEES (1.00 @ 1.00 @ \$200.00 + 0.000 % + 0.000 % + 0.000 %)		200.00

Subtotal		19,888.50
Markup (@ 10.000 %)		1,988.85

Subtotal		21,877.35
ASPHALT PATCHING (\$1,005.60 + 0.000 % + 0.000 % + 5.000 %)		1,055.88
CONCRETE SIDEWALK (\$500.00 + 0.000 % + 0.000 % + 5.000 %)		525.00
6" BORE @ 2ND ST 100' (\$1,690.00 + 0.000 % + 0.000 % + 5.000 %)		1,774.50

Subtotal		25,232.73
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Final Amount		\$25,232.73
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CONTRACTOR CERTIFICATION

Name:	<u>Robert B. W. cd</u>
Date:	<u>4-15-2020</u>
Signature:	<u>[Signature]</u>
I hereby certify that this quotation is complete and accurate based on the information provided.	

CLIENT ACCEPTANCE

CCN #:	15
Final Amount:	\$25,232.73
Name:	_____
Date:	_____
Signature:	_____
Change Order #:	_____
I hereby accept this quotation and authorize the contractor to complete the above described work.	

ORIGINAL



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Agenda Item**

6.1

MEETING DATE: May 12, 2020
FROM: Valerie Manning
SUBJECT: Minutes - April 28, 2020, Regular City Commission Meeting
NUMBER: (ID # 2885)
APPLICANT:
PLANNER:

DISCUSSION:

Minutes from the April 28, 2020 regular City Commission meeting.

MOTION:

Approve minutes as submitted by staff.

- Minutes - April 28, 2020 - Regular City Commission meeting (PDF)



CITY OF HOLLY HILL, FLORIDA

CITY COMMISSION

MINUTES • APRIL 28, 2020

City Commission Chamber

Regular City Commission Meeting

7:00 PM

CITY HALL
1065 RIDGEWOOD AVENUE
HOLLY HILL, FL 32117

City Clerk's office: (386) 248-9441 - Fax: (386) 248-9448

1. CALL TO ORDER

a. Roll Call

Attendee Name	Title	Status	Arrived
Chris Via	Mayor	Present	
John Penny	District 1 - Commissioner	Present	
Penny Currie	District 2 - Commissioner	Present	
John C. Danio	District 3 - Commissioner	Present	
Roy Johnson	District 4 - Commissioner	Present	

b. Invocation by City Commissioner Roy Johnson

c. Pledge of Allegiance

Mayor Via led the Pledge of Allegiance to the Flag.

2. PUBLIC COMMENTS

No one spoke.

3. APPROVAL OF MINUTES

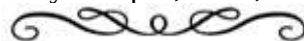
1.

Minutes - April 14, 2020 Regular City Commission and CRA Meeting

(Requested by Valerie Manning, City Clerk)

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Roy Johnson, District 4 - Commissioner
SECONDER:	John C. Danio, District 3 - Commissioner
AYES:	Via, Penny, Currie, Danio, Johnson

Enacted and approved this 28th day of April, 2020, in Holly Hill



4. CONSENT AGENDA - ITEM (1)

Mayor Via opened public participation. No one spoke.

1. -2020-R-18 Resolution

A Resolution of the City of Holly Hill, Florida, Acknowledging that the City of Holly Hill is Operating Under the County of Volusia's Declaration of State of Local Emergency, Including All Extensions, Related to the Coronavirus Disease (COVID-19) in Coordination with the Emergency Declarations of the Office of the Governor for the State of Florida and the President of the United States of America to Safeguard the Lives and Property of Its Residents; and Providing for an Effective Date.

(Requested by Valerie Manning, City Clerk)

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	John Penny, District 1 - Commissioner
SECONDER:	Penny Currie, District 2 - Commissioner
AYES:	Via, Penny, Currie, Danio, Johnson

RESOLUTION

2020-R-18

A RESOLUTION OF THE CITY OF HOLLY HILL, FLORIDA, ACKNOWLEDGING THAT THE CITY OF HOLLY HILL IS OPERATING UNDER THE COUNTY OF VOLUSIA'S DECLARATION OF STATE OF LOCAL EMERGENCY, INCLUDING ALL EXTENSIONS, RELATED TO THE CORONAVIRUS DISEASE (COVID-19) IN COORDINATION WITH THE EMERGENCY DECLARATIONS OF THE OFFICE OF THE GOVERNOR FOR THE STATE OF FLORIDA AND THE PRESIDENT OF THE UNITED STATES OF AMERICA TO SAFEGUARD THE LIVES AND PROPERTY OF ITS RESIDENTS; AND PROVIDING FOR AN EFFECTIVE DATE.

A RESOLUTION OF THE CITY OF HOLLY HILL, FLORIDA, ACKNOWLEDGING THAT THE CITY OF HOLLY HILL IS OPERATING UNDER THE COUNTY OF VOLUSIA'S DECLARATION OF STATE OF LOCAL EMERGENCY, INCLUDING ALL EXTENSIONS, RELATED TO THE CORONAVIRUS DISEASE (COVID-19) IN COORDINATION WITH THE EMERGENCY DECLARATIONS OF THE OFFICE OF THE GOVERNOR FOR THE STATE OF FLORIDA AND THE PRESIDENT OF THE UNITED STATES OF AMERICA TO SAFEGUARD THE LIVES AND PROPERTY OF ITS RESIDENTS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Office of the Governor for the State of Florida signed Executive Order Number 20-52 declaring a state of emergency in response to the threat of the Coronavirus Disease (COVID-19) on March 9, 2020, a copy of which has been attached to this Resolution as Appendix A and hereby incorporated; and

WHEREAS, the President of the United States of America signed Proclamation 9994 declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak on March 13, 2020, a copy of which has been attached to this Resolution as Appendix B and hereby incorporated; and

WHEREAS, the Volusia County Council signed a Declaration of State of Local Emergency Related to the Coronavirus Disease (COVID 19) on March 13, 2020 with subsequent extensions, a copy of which has been attached to this Resolution as Appendix C and hereby incorporated; and

WHEREAS, Section 252.38(l)(c) of the Florida Statutes states that counties shall serve as liaison and coordinator of municipalities' requests for state and federal assistance during post-disaster emergency operations; and

WHEREAS, Section 252.38(2) of the Florida Statutes provides that if a municipality does not have a formal emergency management plan adopted pursuant to Florida Statute Chapter 252, the municipality is served by the county's emergency management agency and plan; and

WHEREAS, the City of Holly Hill does not have an emergency management plan adopted pursuant to Florida Statute Chapter 252 in regards to the COVID-19 virus threat; and

WHEREAS, the County of Volusia has encouraged all municipalities residing within their jurisdiction to be governed by their emergency management programs to provide a more coordinated response to the spread of the COVID-19 virus; and

WHEREAS, the City of Holly Hill believes a county-wide coordinated response under the direction of the Office of the Governor for the State of Florida is the most effective way to combat the spread of the COVID-19 virus regionally.

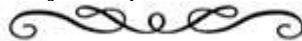
NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. The City Commission of the City of Holly Hill, Florida, hereby acknowledges that the City of Holly Hill is operating under the County of Volusia's Declaration of State of Local Emergency Related to the Coronavirus Disease (COVID-19), including all subsequent extensions, in coordination with the emergency declarations of the Office of the Governor for the State of Florida and the President of the United States of America.

SECTION 2. EFFECTIVE DATE. This Resolution shall become effective immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 28th day of APRIL, 2020.

Enacted and approved this 28th day of April, 2020, in Holly Hill



5. REGULAR AGENDA

1. -2020-R-19 Resolution

A Resolution of the City Commission of the City of Holly Hill, Florida, Approving the Proposed FY 2020-2021 CDBG Annual Plan Application and Authorizing the City

Manager to Submit the Approved Annual Plan to Volusia County Community Assistance; and Providing for Severability; and Providing for an Effective Date.

(Requested by Antoine Khoury, Public Works)

Mayor Via opened public participation. No one spoke.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	John Penny, District 1 - Commissioner
SECONDER:	John C. Danio, District 3 - Commissioner
AYES:	Via, Penny, Currie, Danio, Johnson

RESOLUTION

2020-R-19

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, APPROVING THE PROPOSED FY 2020-2021 CDBG ANNUAL PLAN APPLICATION AND AUTHORIZING THE CITY MANAGER TO SUBMIT THE APPROVED ANNUAL PLAN TO VOLUSIA COUNTY COMMUNITY ASSISTANCE; AND PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

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WHEREAS, the US Department of Housing and Urban Development's Community Development Block Grant program, through Volusia County Community Assistance, has notified the City of Holly Hill of an anticipated award of \$100,119 for fiscal year 2020-2021; and

WHEREAS, the City has identified the refurbishment of Lift Station #17B for funding through this project; and

WHEREAS, the City desires to submit its annual plan proposal to Volusia County Community Assistance.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. That the proposed plan is hereby approved to be submitted as part of the fiscal year 2020-2021 CDBG Annual Plan.

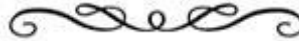
SECTION 2. That the City Manager is authorized to execute and submit the 2020-2021 CDBG Annual Plan proposal.

SECTION 3. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 4. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 28th day of APRIL, 2020.

Enacted and approved this 28th day of April, 2020, in Holly Hill



2.

Request for Lien Reduction - 904 Daytona Avenue

(Requested by Joseph Forte, City Manager)

Attorney Simpson spoke to the Mayor and City Commissioners about the lien reduction for 904 Daytona Avenue.

Mayor Via opened public participation.

Russell Dixon, 904 Daytona Avenue, owner of property requesting lien reduction.

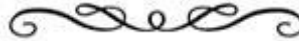
Mayor Via closed public participation.

*Commissioner Johnson made a motion to **RELEASE THE LIEN AT NO COST TO THE BUYER**, seconded by Commissioner Currie.*

PASSED, 5-0.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Roy Johnson, District 4 - Commissioner
SECONDER:	Penny Currie, District 2 - Commissioner
AYES:	Via, Penny, Currie, Danio, Johnson

Enacted and approved this 28th day of April, 2020, in Holly Hill



6. **PUBLIC HEARINGS - NONE**

7. **COMMUNICATIONS**

A. City Manager & Staff Comments

Mr. Forte stated a couple of things he wants to update the Commissioners on and get some feedback on. The Mayor is on the weekly calls with the Mayors and he's on the weekly calls with the Managers and we're a little bit aware of the process as we are moving forward in reopening the State of Florida and specifically with Volusia County and its cities and getting back to some degree of normalcy. As we move forward, I just wanted to let the Commissioners know that when that time comes, we're going to

continue to maintain social distancing in City Hall and they will probably see six feet markings on the floor to allow people to wait in the hallway before they pay their utility bill. The city is going to try and maintain that as much as possible and will continue to wipe down areas where the public comes in and limit where the public comes in the building like we did the first time. We will have them come up the elevators and come down the hall to get to the Utility Billing Department and limited access into the Building and Zoning Department. We are going to slowly open up the rentals at Sica Hall. He's pushed everything out to two weeks. So, every day their two weeks from opening. When they do get that go-ahead, it's not going to be tomorrow, it will be a week or two out when we start to open things back up again and even at Sica Hall, we will probably end up limiting that participation to small groups again like when they closed it down until it opens up completely. The last thing he wants to talk about and he and the Mayor have spoken a little bit about this, is with regards to the utility bills and where the city is with them. At what point, right now the city is still charging late fees and penalty fees, except for those people who contact the city and they've filled out a hardship letter basically indicating that perhaps they lost their job, they're unemployed, there is some other hardship in their family, maybe someone is sick, that the city is waiving their late fees and penalty fees but for the most part, all those are still in place. As the city goes into the next month, and this is the month, April, when most people have been laid off or furloughed and they got their last paycheck and they may have been able to pay their bill or they may not have been able to pay their bill, hopefully they got a stimulus check. His concern is, the next month. That's going to be an even more critical month. They have to figure out what they want to do moving forward because at some point turnoff's come back into the picture, delinquent accounts come back into the picture. He wanted to get the Commissioners input on how they would like staff to start to proceed. Do they continue doing what they're doing or does the Commissioners want to do something different. He wants to leave it as an open conversation and maybe they can reach a conclusion at the end.

Mayor Via stated he had it in his notes to bring it up tonight. He's received a lot of questions and complaints about what the city is or maybe isn't doing. There's a lot of misinformation out there. A lot of people aren't quite sure. They have all sixteen municipalities as much as the Managers and the Mayors are trying to keep continuity, they get a rogue Commission, maybe to the south of Holly Hill, who wants to stand out and do their own agenda, which is fine. They have to serve their own people. There's a lot of people that aren't sure of what's going on. One topic that's come up over and over, he's sure all of the Commissioners are hearing it, is about late fees. Why is the city still charging late fees? And of course, we know why we're charging late fees but Mr. Forte and himself have had many conversations about this and tonight he wants to see if, where the Commission really wanted to stand on it. He spoke to Mr. Forte and the Finance Director today and had them pull some numbers for the Commission so they can kind of see where we are. It looks like the total monthly average revenues from their utilities are \$685,000 a month and you have penalty fees averaging about \$20,000 a month then they have the utility accounts receivable in March, which is really interesting, just in this past March, was up \$30,000 or 6% of what they expected to bring in revenue wise and maybe that's because more people are home, they're using more dishes, they're putting the

dishwashers through the cycles. He is not sure what exactly why that is but what it comes down to is penalty fees are averaging about \$20,000 a month. They know that there's a lot of people out there that are out of work, they know that a lot of people received, hopefully, their stimulus check, which hopefully got them through to make some of those bills but as Mr. Forte alluded to, he thinks that May is really going to be the tough month for people. Maybe they got laid off at the end of March and they had a little bit of something to get them through April and maybe they're having a hard time now. He would certainly be opened to, and he would like to have a discussion, considering waiving the late fees for one month; for the month of May. He just wants to see where the Commission was. He is open to ideas. Mr. Forte and himself talked about another idea of the potential of maybe going retroactive and looking at last month in who was late and then giving them a credit the next month or this next bill, that way they don't have people, maybe, abusing the system by saying, "oh, well, if I'm not going to have a late fee, I may as well wait a couple of weeks to pay this." The city doesn't want that happening and they don't want people taking advantage of the system. At the same time, he thinks that it would give some families that added bit of comfort where if they lost their job, they're not going to face a \$20 fee or whatever the fee is going to be, if they can't pay it for at least a couple of more weeks.

Commissioner Penny stated he fully supports Mayor Via's idea of waiving the late fees for the month of May. He's not really interested in going back and crediting...he thinks it's going to be an accounting nightmare. Staff does have the ability, if someone has problems paying right now, to do a case-by-case/one-on-one. He doesn't think anyone is going to pay their water bill two weeks late if they have the money just to get away with \$20. He does support waiving all late fees for the month of May.

Mr. Forte stated they can do that moving forward. He spoke to one of the city's south of Holly Hill, not directly south of Holly Hill and they're in the same position that Holly Hill is in. They're very similar to us. They're doing the same thing that Holly Hill is and they were kind of delaying to offer a credit later. Possibly in June. He thinks that could be a little problematic in going back and issuing credits if it's a flat credit to everyone or if it's a credit to the only ones who are late. He thinks there are more problems with that. He would also mention the concern of the, sometimes you get the theory of "what have you done for me lately" and if they do something now, in a month, they're going to say now you have to do something else. So, they have to be careful of that. If they do this, he still wants to promote it and encourage people to pay their bill. If you can't pay your bill in full, pay what you can. Because what happens in June, if they don't pay their May bill, when the late fees come back on, it catches up. The late fee is based on the value and if they didn't pay for May and now they're late with June, well, instead of paying the late fee in May and June, they're going to pay a double fee in June because it goes on their balance. He wants people to try and pay as best as they can. He will need the Commissioners to take action and let him know how they would like to handle that and then do they do it silently? Do they put it on Facebook? Or do they just don't charge the late fees and they just don't do it and then that's it. He doesn't want to be promoting it and encouraging people to not pay for, like Commissioner Penny said, you might have some people that do that, hopefully you don't but it's possible that they will get people that say, "well, when you're robbing Peter to pay Paul, I'll let my \$100 water bill go

because I won't get a penalty and I'll try to catch up next month", and then that compounds. They don't want to encourage people to not pay it but they want to be able to support those that can't afford to pay it and give them that credit.

Commissioner Currie agreed to supporting waiving the late fees for May and she likes the hardship letter for April.

Mr. Forte stated and they haven't had a lot of requests for the hardship letter.

Commissioner Currie stated and let's say somebody didn't pay April, they had a hardship and they filled out the letter, the city is giving them May late fee, let's say they don't pay April and May, that is due in full in June, correct?

Mr. Forte stated, which is his next question. Is when do they do cutoffs?

Commissioner Penny asked doesn't the Finance Department have the ability to work with someone when they get a big bill? Like, if their kid left a tap on and 20,000 gallons...

Mr. Forte stated, sure. They can put people on payment plans.

Commissioner Currie stated that's what she was going to ask. Can't the city, at some point, if people have had a hardship over April and May, especially, couldn't the city just...

Mr. Forte stated they can take...

Commissioner Currie stated some kind of a hardship and make payments?

Mr. Forte stated they can, as an example, if somebody doesn't pay April and May, their June bill, they will contact the city and let staff know they are having a hard time financially, they understand they have an obligation, what the city can do is smooth that bill out over three months. Their June bill would be a regular bill and their July and August bills would be double bills. It would be July and April and it will be August and May. It's equivalent to a double bill. That's the point that he needs people to understand. The city can't smooth them out for six months.

Commissioner Currie stated no, she's talking about for three months.

Mr. Forte stated if they did it for three months, they're delinquent to, they would pay a 1 and 2/3 bill.

Commissioner Currie stated, right.

Mr. Forte stated if they pay June timely.

Commissioner Currie stated she thinks it would make it easier for people. The Commission has said up here many times, a lot of their citizens have a really difficult time living paycheck to paycheck and she's just trying to look out for that end as well, Mayor, when they go back in. She thinks cutting the bill up, if it's April or May, whatever it ends up being, slice it times the three months and let staff put that on top of the other bill.

Mr. Forte stated now remember, nothing here is automatic. This is all labor intense,

manually done by staff.

Commissioner Currie asked how hard would that be?

Mr. Forte stated every customer that contacts the city, now the Commission has to remember, these bills go out in certain time periods and the calls are going to come in, in volumes, if everybody wants to do this, and there's going to be a busy signal. There's going to be a lot of busy signals because he doesn't have that many people in the billing department to do it. The employee has to go into the account and record and issue that bill out, manually put it in. The system doesn't do it. The employee has to manually go into everyone's account. Now, it all depends on how many people call.

Commissioner Currie stated that's what she was going to ask. Right now, do they have any idea, right now...

Mayor Via asked how many hardships have applied?

Mr. Forte stated not a lot of hardship letters have come in but he spoke with the ladies in the billing department behind the glass today and they said every other or every third phone call is someone complaining in that Holly Hill is not doing the same thing that Daytona did.

Mayor Via stated, right.

Mr. Forte stated so there is a large number of calls coming in about that.

Commissioner Currie stated, well, we're definitely not Daytona and we can't do the same thing.

Mayor Via stated Holly Hill doesn't over charge for the water.

Commissioner Penny stated one thing, Mr. Forte, that hopefully, he can communicate back to the Finance Department, when they are getting those calls, encourage the resident to pay whatever they can towards that bill to prevent that double bill.

Mr. Forte stated he may actually write a script for them.

Mayor Via stated that's what he was going to say, definitely. But then also, another script at least coaching to where when the city does get into June, and some is desperate, they have to be told, "the city is going to work with you." Because what he has heard is people calling and saying they can't pay this and they weren't told about the hardship letter. If the residents aren't being told about the hardship letters then what the city was trying to do, doesn't work.

Mr. Forte stated, right. There is going to be some coaching that's involved. He may do a letter. Remember, the folks that are behind the glass feel that they have limited flexibility in what they can do.

Commissioner Currie stated if they know that a hardship letter is available, they can just present the letter and tell them to turn it in.

Mr. Forte stated, right.

Commissioner Currie stated she likes the idea of waiving the late fees for May, hardship April, and then the three payment process.

Commissioner Penny stated a double bill sounds cumbersome but he knows the unemployment system and the stimulus system, it's overwhelmed right now. Hopefully, when they get to that double bill period, we're talking 60 days from now, 45 days from now, hopefully they would have received some assistance through unemployment or they're back to work with their employer, they might have the PPE which would put them back to work tomorrow. There's a lot of things that are trickling in, not as fast if you haven't gotten it, but he thinks over the next 45 days some of the fears may be calmed financially.

Mayor Via agreed. He thinks there's more people that will take advantage of this that actually need it, not necessarily looking for a hand out, but maybe they were a waitress a two different places, now they really can't work but come June, they're going to be opened back up and they're going to be working.

Commissioner Currie stated but it's still going to take them some time.

Mayor Via stated it is; of course it is.

Mr. Forte stated and he does want to have the ladies in billing tell the customers, at the time of that phone call, as they're going through this process, that a cutoff is inevitable come the end of June if they can't make their payments. He wants the customers to know that, on that phone call, that the relationship is no late payment for May, which means now you'll have a double bill in June, if you can do that, and if not, we'll smooth you out for three months, but if you miss a bill, you're going to get cutoff.

Mayor Via stated, yes. There are consequences.

Mr. Forte stated he wants the ladies to be able to...so the Commissioners may get phone calls from people that are going to say, "well, they told me I have to pay this or I'm going to get cut off", yes.

Mayor Via stated and at the end of the day, we can only help so much. We can't give away free water.

Commissioner Currie stated splitting it up for somebody that's just getting their job back...

Mr. Forte stated the city has a high turnoff already in this city because the city has a lot of rental properties.

Commissioner Currie stated and she knows when she was younger, we were younger, to have that option would have helped out tremendously. She's looking out for the people that are living paycheck to paycheck and right now, they're not getting one.

Commissioner Danio stated he's okay with it too but he thinks we should keep it under the radar. He doesn't think they should promote it.

Mr. Forte stated the city is just going to do it. We're not going to announce it on Facebook, we're not going to announce it to the media.

Mayor Via stated well, what he could say, because he came in thinking the same way Commissioner Danio, but what Vice-Mayor Penny said, is really true, that I don't think that someone is going to necessarily, for instance himself, I've always been pretty much on time, maybe late once or twice, I'm not going to wait an extra two weeks. He thinks what Commissioner Penny said had a lot of validity, for a small little fee, I'm not going to try and hold off for two weeks just because of that. But if may benefit people who are like, "I have exactly this much money and it's between keeping my water on or purchasing this food or whatever have you", and for that decision would be, "okay, I can wait two weeks to pay that."

Commissioner Penny stated maybe put it on social media once or twice but not every day.

Mr. Forte stated if you put it on social media, the News-Journal is going to run it.

Commissioner Penny asked is anyone not going to pay their bill to stick it to the city for a \$20 late fee that really isn't money anyway? Because they're going to pay it on time next month.

Mr. Forte stated it's not the late fees he's concerned about. Like he said, they have a very high rental community and it's not unusual that a renter doesn't pay the last couple of utility bills before they don't pay the last month's rent before the leave.

Commissioner Penny stated the city doesn't ever get that money anyways. They write-off hundreds of thousands of dollars every year for that.

Mr. Forte stated and that's what he is trying to avoid is "adding" to that.

Mayor Via stated they're talking about one month.

Mr. Forte stated no, it's three months. We pay our bills in arrears.

Commissioner Currie stated if she may, at some point, they have to take a step back and realistically look at the demographics of their city, they're going to need that. She thinks a majority of, that are going to use the late fee waiver, they're going to need to break up whatever payment they have that they're behind. She thinks it will be helpful.

Mr. Forte stated he thinks paying something.

Commissioner Currie stated she thinks they need to encourage them to pay something, absolutely.

Mr. Forte stated that's what he's saying. Is to pay something. If they pay \$20, that's something.

Commissioner Currie stated but she wants people to know, as well, that's available to them. She thinks the city is doing a disservice if they don't let the residents know that this is available to them.

Mayor Via agreed.

Commissioner Currie stated because most people aren't going to call up and ask.

Mayor Via stated, right. And if they do call and ask, staff needs to be able to tell them.

Commissioner Currie stated, absolutely.

Commissioner Johnson stated he doesn't have a problem with any of it whatsoever because right now a lot of people are struggling, a lot of people are not getting a paycheck, they can't work. He's fortunate enough to be able to still go out and work because he mostly works alone. He's sure that's a lot of stress. They're going through the stress of having to stay home and having to do without this, that or the other. Why add to it. If it's not a necessity for the city to get it, he means, it's really a bind for the residents to pay it. So, he's all for giving them a break on it.

Mayor Via told Mr. Forte that he has consensus from the Commission. He knows that Mr. Forte has the authority to do this.

Mr. Forte stated yes, he knew he had the authority to do it but he wanted the Commission's input to get there.

Mayor Via stated thank you because it's a major decision.

Mr. Forte informed the Mayor and Commissioners that they will be having a Board of Planning and Appeals meeting on May 4, 2020. There are three items that are on that agenda. Mr. Walker and himself talked a little about getting some feedback from BOPA about the zoning on the property on Riverside Drive. Once we get a little bit of the BOPA's feedback, depending on what direction they want to go in, or make a recommendation to go in, Mr. Walker and himself will determine what they bring back to the Commission. They didn't want to go with a straight forward rezoning land use change because that's expensive and timely. The BOPA may recommend just a lot restriction on the existing zoning. Mr. Walker and himself will get some feedback from the BOPA and then they will report that information to the Commissioners.

Mayor Via asked if it's just a discussion item?

Mr. Forte stated right now it's a discussion item.

B. City Attorney Comments

None.

C. City Commission Comments

Commissioner Danio stated people are doing real well, at least in his business, everyone is the CDC guidelines and he's just hoping and praying that the State doesn't jump the gun on this thing because everybody's chomping at the bit to get back out, the Governor's under a lot of strain and everybody's under a lot of stress, and everything else. The worst thing could happen, especially, when you looked at Sunday's paper, they had a picture of the Spanish Flu and 1917 and they had two kids in a mask in black and white pictures, if they saw it in Sunday's News-Journal, it was 100 year old. It was the same thing except it was in black and white and it had these little kids wearing masks and they were from 1918 and the article talked about how it came back twice after. He just

started thinking, boy, I hope we don't jeopardize all the work that has been done so far, that's all.

Mayor Via opened public participation at this time for anyone who may be listening to the meeting and would like to call in. ***There was no one that called.***

Mayor Via wanted to say something to Commissioner Johnson's point that he made him think of, Mr. Forte and himself had this conversation today and we have all this momentum here in the city, moving forward, great things are happening and then this pandemic hits and Mr. Forte and himself talked today about the mountain that the Commission is going to face this budget session because we're going to see that their revenues are going to be extremely far down. It's going to be a tough budget session and he thinks they should all know that going into it with open eyes. Mr. Forte, I don't know if you want to share what you said to your Department Heads.

Mr. Forte stated in preparing for the mid-year budget adjustments that they do each year, he's asked the departments to look at both a 10% and 15% reduction to their operations budget. Some of them are going to be difficult to get to because we're already halfway through the year; not the total budget but the balance of what's in their budget, to try and look for 10% or 15% reductions. He did it in his area, he did it in the Commissioners area.

Mayor Via stated so, no shirts.

Mr. Forte stated the shirts are still in there but no conference, which is probably going to be cancelled anyway. Some of the discussions are...it's very reminiscing to 2009-2010; it was a tough time. He was in Seminole County, he had just left here. It was a tough time in Seminole County, he's sure it was a tough time here; 20% of the employees were laid off during that time in most governments. Mr. Forte stated we're looking at, potentially, 25% to 30% loss revenues next year. That's only half of the scary part. The other scary part is not knowing what happens with the values of homes and what the Property Appraiser is going to do. If values of homes decrease, we'll feel that the following year. We're a year behind on revenues. We put a hold on everything. The fountain out front, it's still a dirty fountain but it may be an empty fountain. We spend too much time maintaining it so it may just be an empty fountain. They had something similar to that in Sanford. There was a building that the engineers designed it and it was on a bit of an angle and the bottom of the first floor was a big water fountain. They had a building on an angle and then it had this other sheet of glass in front of it. So the theory was, when the fountain worked, evaporation would go up between the two panes of glass and cool the building, well, it's now a garden. That might be the nicest round garden they have in front of City Hall because the fountain is a lot of work with the labor that's put into it. Staff cut a lot of things out of the budget moving forward. Things that were already in process they are continuing with because they've already been ordered. Enterprise Fund items are still moving forward. In other words, water and waste water plant operations, their Capital Projects are still moving forward because they're funded differently. It's primarily the General Fund. He put a hold on not hiring the Economic Development Director's position even though that's a CRA funded position, he put a hold on the Code Enforcement position which is vacant.

Mayor Via asked if there are any openings in Finance right now?

Mr. Forte stated no, the Finance Department is fully staffed. There's a position in the Fire Department that's vacant but we are seeking to fill that but there is some lapse salary in there to make up a little bit but overtime cost kind of cut into that when they have to back fill. Going into this mid-year budget, the Commission is going to see some cuts and preparing for next year's budget they're going to see even more reductions. It's going to be a tough budget year.

Commissioner Johnson stated and one month from now starts storm season. We better be ready for a bad one again because we've already had a sample across the country as to how some of these storms are going to be. We have to take that into consideration as well.

Mr. Forte informed the Commissioners that staff did update the Emergency Management Plan last week and they are preparing for that and staff has had its conversations about hurricane preparedness as well. Lastly, about the website being down. Two things. One is the website was never really down. They did have an employee telling people the website was down and it's not. What they had was when they changed the way, remember the city isn't charging the credit card fee, so the credit card provider, changed the link on the city's website and some people had the old link still stored in their computers. Instead of clicking on the new link, that ran them into that problem. Staff is pumping out the new link so that people know to go to the website to click on it, rather than having it stored.

D. Mayor's Comments

Mayor Via stated he wanted to bring up a couple of good things going on in the community. There's a lot of people stepping up and doing a lot of good. He received a phone call a few days before the event asking if this organization could use City Hall as a Food Drop resource to give out food as a food bank and that was through Second Harvest Food Bank of Central Florida; we want to give them a lot of thanks, Calvary Christian Center and the Dream Team Center that put that together and also, Heroes Hope Network who reached out to the city, WAPN here in Holly Hill helped to promote that as well, and he wants to thank Mr. Forte for allowing that to happen and welcoming them with open arms and coordinating that, he wants to thank Commissioner Currie who was here to help out and volunteer, he appreciates her being there for that. Good stuff; 442 families served, over 1,553 meals. That's a lot of food. There are good things going on in the community. Someone else he wanted to shine a light on is a lady named Elizabeth Bell and her husband, Ron Bell. The Commissioners may have received the email that they reached out to City Hall and asked how many employees does the city have because they bought gift cards for them all to *Mi Hogar* here in Holly Hill for them to purchase a lunch. They wanted to do that because they said our employees are still fighting to keep the city going and working very hard. That was really kind of them. These are people, like he talked about before, the Hometown Heroes, these are people that the city is going to have to recognize because they stepped up without looking for recognition, just out of the goodness of their heart. Previously, before that, they had spent thousands of dollars giving gift cards to first responders, nurses and doctors on the front line. They are really good people. The Mayors weekly call, every Thursday that he's on, which is why he couldn't be at the food drop to volunteer, the only real thing he wanted to bring up, is that

there are a lot of Seniors graduating this year that kind of had their Senior year ripped from them, as the Commissioners have probably all seen on Facebook, there's an ***Adopt A Senior***, which is really neat. Some of the cities are looking to possibly put together something to honor their Seniors and maybe making banners and putting their names on it. A couple of Mayors threw out the idea of putting their faces on it but the bigger cities, like DeLand, apparently has 400 or 500 graduation Seniors so that's not going to happen there. He has no clue how many Seniors Holly Hill would have but he would assume it's a lot less than most others because we're smaller in size. He doesn't know if any of the Commissioners have any ideas to honor Seniors. Even if it was just a social media feel good thing, he thinks it would be appreciated. Maybe the Commissioners can think on that.

Mr. Forte stated maybe they can put something on the digital sign that says "Congratulations to our Holly Hill Graduates" and put their names on their and let the names run for a couple of days or a week and get them some recognition and it doesn't cost the city anything. He will see if he can get a head count.

8. **ADJOURNMENT**

The meeting adjourned at approximately 8:00 PM.



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Resolution**

7.1

MEETING DATE: May 12, 2020
FROM: Antoine Khoury
SUBJECT: A Resolution of the City Commission of the City of Holly Hill, Florida, to Award the Bid for the "Rehabilitation of Lift Station #9 (CDBG)" to Cain Enterprises, DbA Engineering Solutions International, (ESI), as the Lowest Responsible Bidder and Approve the Contract in the Amount of \$249,999.00; Providing for Severability; and Providing for an Effective Date.
NUMBER: 2020-R-21
APPLICANT:
PLANNER:

DISCUSSION:

During an evaluation of the City's lift stations it was determined that Lift Station #9, located at 1601 Riverside Drive, is in need of refurbishment. This lift station is over 50 years old and has not had any significant upgrades or improvements in that time. This lift station is located within the eligible improvement area of the Community Development Block Grant (CDBG) and was approved by the City Commission as the City's FY 2019-2020 project.

The proposed refurbishment will include replacing existing hardware, installing submersible pumps, rails and pipes. Additional work will include dewatering, bypass pumping, electrical work, maintenance of traffic, restoration and the furnishing of As-Built drawings.

This refurbishment is consistent with the need to upgrade facilities to reach full compliance with Department of Environmental Protection standards and protect health, safety and welfare of our citizens.

The City has received nine (9) bids for this project and the low bidder is Cain Enterprises dba Engineering Solutions International (ESI) of Ocala, Florida, with a total bid of \$249,999.00. Staff and City's consultant have reviewed ESI's bid package and have found it responsive and is qualified to complete this project.

FISCAL ANALYSIS:

Bids were opened on April 28, 2020. ESI submitted the lowest total of \$249,999.00. The project is fully funded as a capital project with in account number 407-8110-580-63-00. Furthermore, this project is partially funded by a CBDG grant in the amount of \$98,384.

STAFF RECOMMENDATION:

Authorize the City Commission to award and the City Manager to execute a contract with ESI for the award of the improvements to Lift Station #9 Rehabilitation.

COMMISSION GOAL:

Goal #1: Develop and maintain a sound and sustainable financial plan for the city that establishes sufficient reserves for all funds, ensures (whenever possible) that user fees pay for services rendered, provides a realistic capital improvement program, and encourages public/private sector partnerships and intergovernmental partnerships.

Goal #4: Provide proficient public health and safety services in terms of police and fire protection, water, storm water, waste water and solid waste management and disaster preparedness with a focus on intergovernmental collaboration, private sector partnerships, and utilization of technologies and proven innovations.

MOTION:

APPROVE AND AWARD CAIN ENTERPRISES DBA ENGINEERING SOLUTIONS INTERNATIONAL, A CONTRACT FOR THE “REHABILITATION OF LIFT STATION #9 (CDBG)”, AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE AGREEMENT.

ATTACHMENTS:

- HH Lift Station #9 Replacement_Bid Set Specifications_02.21.20(PDF)
- HH Lift Station 9 Rehab BID SET (PDF)
- 20-WW-02-Bids-Recieved (PDF)
- Holly Hill Lift Staion #9 Replacement 20-WW-01-Cain dba ESI (PDF)
- Recommendation of Award 4.30.20 (1) (PDF)

Resolution No. 2020-21

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, TO AWARD THE BID FOR THE "REHABILITATION OF LIFT STATION #9 (CDBG)" TO CAIN ENTERPRISES, DBA ENGINEERING SOLUTIONS INTERNATIONAL, (ESI), AS THE LOWEST RESPONSIBLE BIDDER AND APPROVE THE CONTRACT IN THE AMOUNT OF \$249,999.00; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, TO AWARD THE BID FOR THE "REHABILITATION OF LIFT STATION #9 (CDBG)" TO CAIN ENTERPRISES DBA ENGINEERING SOLUTIONS INTERNATIONAL, (ESI) AS THE LOWEST RESPONSIBLE BIDDER AND APPROVE THE CONTRACT IN THE AMOUNT OF \$249,999.00, AUTHORIZING THE CITY MANAGER TO AWARD AND EXECUTE THE AGREEMENT; AND PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, During an evaluation of the City's lift stations it was determined that Lift Station #9, located at 1601 Riverside Drive, is in need of refurbishment; and

WHEREAS, This lift station is over 50 years old and has not had any significant upgrades or improvements in that time; and

WHEREAS, This lift station is located within the eligible improvement area of the Community Development Block Grant (CDBG); and

WHEREAS, as low responsive/responsible bidder, Cain Enterprises DBA Engineering Solutions International (ESI) has submitted a bid in the amount of \$249,999.00 to the City of Holly Hill to rehabilitate Lift Station #9; and

WHEREAS, the City's consultant and City staff have evaluated and find the proposal to rehabilitate Lift Station #9 to be acceptable.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. Approve a contract with the lowest responsible bidder, Cain Enterprises dba Engineering Solutions International (ESI) and authorize the City Manager to award and execute a contract with ESI, for \$249,999.00 for the "Rehabilitation of Lift Station #9 (CDBG)."

SECTION 2. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 3. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020.

PROJECT MANUAL

LIFT STATION #9 REPLACEMENT

BID # 20-WW-01



Mead & Hunt, Inc.
Project # 1000710-191037.01

Prepared for:
City of Holly Hill

February 2020

Mead&Hunt

4401 Eastport Parkway
Port Orange, FL 32127

Phone: 386-761-6810
www.meadhunt.com

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CITY OF HOLLY HILL

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SECTION 00 02 00
INVITATION TO BID
CITY OF HOLLY HILL, FLORIDA
LIFT STATION #9 REPLACEMENT
BID# 20-WW-01

Notice is hereby given that the City of Holly Hill, Florida is accepting bids for:

LIFT STATION #9 REPLACEMENT

Sealed bids will be accepted by the City of Holly Hill, 1065 Ridgewood Avenue, Holly Hill, Florida 32117, ***until 2:00 p.m., April 28, 2020*** at which time and place all proposals received shall be publicly opened and read aloud in the City Hall.

There will be a non-mandatory pre-bid meeting for this project ***at 2:00 p.m. on April 7, 2020***. The meeting will be held in the Commission Chambers, located in City Hall, 1065 Ridgewood Avenue, Holly Hill, FL 32117.

Description of Work: *The replacement includes the conversion of the can lift station into a submersible station. Work includes bypass pumping, demolition of (2) existing pumps, piping, and valves to abandon pump can. Installation of two (2) new submersible pumps, top slab, piping, valves, valve vault, electrical panel and control panel.*

Copies of the bid documents may be obtained electronically from VendorLink at www.myvendorlink.com. Any addenda to these bid documents will be posted on the VendorLink website. It is the bidder's responsibility to confirm that all addenda have been received prior to submitting a bid for this project. All questions should be directed **in writing** to portorangebids@meadhunt.com. Questions to be submitted no later than 5:00 p.m. on ***April 23, 2020***.

A certified check or bank draft, payable to the City of Holly Hill, Florida, or a satisfactory bid bond executed by the Bidder and an acceptable surety, in an amount equal to five percent (5%) of the bid, shall be submitted with each bid. NO bid shall be withdrawn for a period of ninety (90) days subsequent to the bid opening without the consent of the City of Holly Hill, Florida.

Upon award, the successful bidder will be required to furnish and pay for a satisfactory Contract one hundred percent (100%) Performance Payment Bond which must be recorded by the Clerk of the Court, Volusia County, and enter into a Contract for Services with the City of Holly Hill.

All bidders are required to complete and submit the "Public Entity Crime Sworn Statement", Form #PUR 7068, as designated by Florida Statutes, Section 287.133(3)(a), with their bids.

The City of Holly Hill is not responsible for the U.S. mail or private carriers or messengers in regard to mail being delivered by the specified time so that a bid can be considered.

This is a federally assisted project and is subject to the Fair Labor Standards Act, which include Davis-Bacon (Certified Payroll), 24 CFR 85.36 (bonding requirements), Section 3 & M/WBE and related acts. Laborers and mechanics employed by general contractors and subcontractors performing construction work on this project shall be paid wages at rates not less than the prevailing rates as determined by the Secretary of Labor in accordance with the Davis-Bacon Act. The prime contractor is responsible for the enforcement of wage compliance and support documentation for the duration of the project and may be held liable for wage

restitution. The applicable information regarding the laws and regulations stated above are included in the bid packet.

No bids received after the time and date specified for the opening will be considered. The City of Holly Hill, Florida reserves the right to reject any and all bids, to waive any and all non-substantial irregularity in bids reviewed, whenever such rejection or waiver is in the best interest of the City.

One (1) original, (4) copies and (1) electronic copy on USB flash drive of the bid shall be addressed to City Clerk, City of Holly Hill, 1065 Ridgewood Avenue, Holly Hill, Florida 32117, in a sealed envelope plainly marked on the outside: **LIFT STATION #9 REPLACEMENT.**

**CITY OF HOLLY HILL
VOLUSIA COUNTY, FLORIDA
s/ Joseph A. Forte
City Manager**

SECTION 00 10 00
INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 PROJECT DESCRIPTION

- A. The work of this project consists of furnishing all labor, materials, equipment, tools, transportation, services, and incidentals and performing all work necessary to construct

LIFT STATION #9 REPLACEMENT

BID NO. 20-WW-01

All above referenced work shall be complete, in place, and ready for service in accordance with the drawings and specifications prepared therefore by Mead & Hunt and entitled,

LIFT STATION #9 REPLACEMENT

- B. The location of the project is the City of Holly Hill, Florida.

1.02 DEFINED TERMS

Terms used in the Instructions to Bidders are defined and have the meanings assigned to them in the General Conditions.

1.03 COPIES OF BIDDING DOCUMENTS

- A. Only complete sets of Bidding Documents will be issued and shall be used in preparing bids. Neither the OWNER nor the ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets.
- B. Complete sets of Bidding Documents may be obtained in the manner and at the location stated in the Invitation to Bid.

1.04 RECEIPT OF BIDS

The Place to which proposal must be delivered, the amount of Proposal Security required and the date, time and place of opening of proposals, are stated in the Invitation to Bid. The Proposal form amplifies the Advertisement in indicating the location and description of the project to be constructed and shows the approximate quantities of work to be performed and materials to be furnished, if a unit price contract, any special requirements which may vary from or are not contained in the specifications. The bid documents as listed in Paragraph 1.08, Preparation of Proposal, shall be submitted as described in Section 00 30 00-3 under Supplemental Requirements.

1.05 BIDDER'S QUALIFICATIONS

The Bidder will be required to show that he/she is capable of performing the work contemplated and shall furnish, if requested, in duplicate the following:

- a. A sworn statement showing the equipment definitely controlled by the Bidder and available to him for performing the work;
- b. A sworn statement of his/her experience in performing work of the character for which his bid is submitted; and,
- c. A sworn statement showing his current assets and liabilities as of a date not more than ninety (90) days prior to the date of submission.

If the Owner approves the above required statements and the Proposal is accompanied by the specified security, the person, firm or corporation submitting such Proposal shall be considered as a qualified Bidder.

1.06 BIDDER'S RESPONSIBILITY

The Bidder is required to carefully examine the site of the project, the Proposal Form, Drawings, Specifications, Agreement Form, and all other forms pertinent to the work contemplated. It will be assumed that he has satisfied himself as to the conditions to be encountered, the character, quality, and quantities of work to be performed and materials to be furnished, and the requirements of the Contract and specifications. No allowance or concession will be made for lack of such information on the part of the Contractor.

Whenever such information concerning subsurface materials or conditions is given on the drawings, it is understood, in the absence of any qualifying notation, that it was obtained in the usual manner and the location, depths, and character of the material have been recorded in good faith. There is no expressed or implied agreement that the depths or the character of the material have been correctly indicated and Bidders should take into account the possibility that conditions affecting the cost or quantities of work to be done may differ from those indicated.

1.07 APPROXIMATE ESTIMATE OF QUANTITIES

The Bidder's attention is directed to the fact that in contracts based on unit prices the estimate of quantities of work to be done and materials to be furnished under these specifications, as shown on the Proposal Form, and in the Contract, is approximate and is given only as a basis of calculation upon which to determine the lowest Bidder. The Owner does not assume any responsibility that the quantities shall obtain strictly in the construction of the Project, nor shall the Contractor plead misunderstanding or deception because of such estimate of quantities, or of the character of the work or location, or other conditions pertaining thereto. The Owner reserves the right to increase or diminish any or all of the above mentioned quantities of work or to omit any of them, as it may deem necessary, and such increase or decrease of the quantities given for any of the items shall

not be considered as sufficient grounds for granting an increase in the unit prices bid, except as set forth in the General Conditions.

1.08 PREPARATION OF PROPOSAL

In preparing Proposals in the manner prescribed under Paragraph 1.14, the Proposal Form, the Bid Form (when a Bid Bond is permitted as proposal security), Certificate as to Corporate Principal, Public Entity Crimes Statement, Anti-Collusion Statement, and Drug Free/Tie Preference Statement, must be properly executed in ink .

Upon the prescribed Schedule of Unit Prices, all bid prices shall be written in ink, in both words and numerals, in the blank spaces for each item, with the amounts extended if a unit price bid and all amounts totaled. In the event of any discrepancy between the written amounts and the numerals, the written amounts shall govern and will be considered as the price bid. The sum of the Total Bid as calculated from the individual items in Section 00 31 00, Schedule of Unit Prices, shall equal the Total Price as listed in Section 00 30 00, Proposal.

Except as provided below, bids containing substitutions or combinations of alternates will not be considered unless such substitutions or combinations are specifically authorized by the Proposal.

In unit price bids, the extensions, if any, and the total are for informational purposes only, and the determination of the lowest bid will be based solely on the total results of computations of the estimated quantities and the prices bid. The Bidder shall submit a completed Schedule of Unit Prices, Section 00 31 00 with each bid. The bid may be considered non-responsive without this form.

The Bidder shall sign his/her name and give his/her business address in the spaces provided therefore. If the Proposal is made as a partnership, it shall be signed by all partners; if made by a corporation, it shall be signed in the name of the corporation by one of the officers thereof and shall have affixed the seal of the corporation.

1.09 PROPOSAL SECURITY

Each Proposal shall be accompanied by a security in the form of a certified check or, when specifically permitted, a Bid Bond, payable to the Owner, in the amount indicated in the Invitation to Bid and, in either case, with properly executed Agreement of Surety. Such proposal security of the successful Bidder shall be forfeited to the Owner as liquidated damages if the successful Bidder fails to execute and deliver the Contract in conformity with the Form of Agreement, and furnish bonds and insurance certificates as specified within ten (10) days after notification by the Owner of the acceptance of his bid, *excluding Bond review by the City Attorney*. Within three (3) days after formal opening of bids, if requested by the Contractor, the securities therefore will be returned excepting those which the Owner elects to hold until the award is made and the successful Bidder qualified and executes the Contract. Thereafter, Proposal Securities, other than that of the qualified low Bidder, will be returned at once. The security of the successful Bidder will be returned to him when the Contract is executed by both parties hereto and the Performance and Payment Bonds

have been recorded. If all Proposals are rejected, the securities therefore will be returned immediately after the determination of such rejection.

1.10 WITHDRAWAL OF PROPOSALS

All Bidders specifically waive any right to withdraw a Proposal after it has been submitted to the Owner, except as hereinafter provided. A Bidder may withdraw a Proposal provided the Bidder makes a request to do so by telephone, telegraph, or in writing to the Owner, and provided that such requests reach the office of the Owner not later than the day previous to the date set for opening thereof. Requests by telephone or telegraph must be confirmed in writing, by the Bidder in person, or by an accredited representative of the Bidder before the time set for the opening of the Proposals. No bids may be withdrawn for a period of NINETY (90) DAYS after the date and time designated for the opening thereof.

1.11 RIGHT TO REJECT PROPOSALS

The unqualified right is reserved by the Owner to waive any informalities in, or reject any or all Proposals as may be deemed to the best interest of the Owner. Proposals which contain any omissions, erasures, alterations, additions not called for, conditional bids, or irregularities of any kind, or Proposals otherwise regular which are not accompanied by Proposal Security, may be rejected as informal. Proposals in which the bid prices are obviously unbalanced may be rejected.

1.12 CHANGES PRIOR TO THE OPENING OF BIDS

During the period allowed for preparation of bids, the Bidders may be furnished addenda or bulletins for additions to or alterations of the Drawings or Specifications, which shall be included in the work covered by the Proposal and become a part of the Contract Documents, Bidders may submit to the Engineer a written request for an interpretation thereof. The Bidder submitting the request will be responsible for its prompt delivery. Any interpretation of the Contract Documents will be made only by addendum duly issued and a copy of such addendum will be mailed or delivered to each prospective Bidder of Record. The Owner will not be responsible for any other explanations or interpretations of the proposed Contract Documents.

1.13 LOBBYING

All firms are hereby placed on **NOTICE** that the City does not wish to be lobbied, either individually or collectively about a matter for which a firm has submitted a Qualification. Firms and their agents are not to contact members of the City Commission for such purposes as meeting or introduction, luncheons, dinners, etc. During the process, **from Proposal announcement to final Commission approval**, no firm or their agent shall contact any other employee of the City in reference to this Bid, with the exception of the Finance Director or the Engineer of record. Failure to abide by this provision may serve as grounds for disqualification for award of this contract to the firm. Additional Federal Anti-lobbying requirements are shown under the **Supplemental Conditions for Federally Assisted Projects**.

1.14 SCOPE OF WORK

Unless otherwise provided in the Construction Specifications or the Proposal, it is the intent of the Contract Documents to prescribe a complete project which the Bidder proposes to construct, by furnishing all labor, materials, equipment, tools, necessary utilities and other facilities, and performing all work necessary to incidental to such construction, in full compliance with the Drawings, Specifications, Proposal, and Contract, and any special requirements contained therein or supplements attached thereto.

Should any construction or condition be anticipated which is not covered by these Specifications, the special requirements thereof will be stated in the Proposal, and any such special requirements shall be considered a part of these specifications as though they were fully contained herein. If any special requirements stated in the Proposal conflicts with any of the provisions of these Specifications, the former shall govern.

1.15 SUBMITTING PROPOSAL

One (1) original, (4) copies and (1) electronic copy on USB flash drive of the Proposal, accompanied by the Proposal Security, and all addenda, if any, and all other required supporting documentation shall be submitted in an opaque, sealed envelope, addressed to the Owner. The name of the Bidder shall appear in the upper left-hand corner of the envelope and the following notation shall appear in the lower left-hand corner.

LIFT STATION #9 REPLACEMENT

1.16 AWARD AND EXECUTION OF CONTRACT

When a Proposal received has been determined to be satisfactory, a Contract will be awarded to the lowest responsible Bidder within the time designated in the Contract Documents.

The Bidder to whom the award is made shall execute the Contract and return it, together with the properly executed bonds and insurance certificates, to the office of the Owner, within the time specified in Paragraph 1.09 of Section 00 10 00.

If the Contractor executes his Contract as herein provided and the Contract is not executed by the Owner within thirty (30) days after the receipt thereof from the Contractor, the Owner upon written request of the Contractor will return the Proposal Security. In such event, the award of the Contract shall be considered as annulled.

The Contract, Surety Bonds, and insurance certificates shall be executed in quintuplicate, or in as many copies as the Owner may require.

1.17 CANCELLATION OF AWARD

The Owner reserves the right to cancel the award of any contract at any time prior to its execution by the Owner.

1.18 SURETY BONDS

With the execution and delivery of the Contract, the successful bidder receiving the Contract award will be required to furnish within the time specified in Paragraph 1.09 of Section 00 10 00, a Payment and Performance Bond, covering faithful and satisfactory performance of the work contracted, in an amount not less than one hundred percent (100%) of the total contract price, and a Public Construction Bond in an amount not less than one hundred percent (100%) of the Contract amount, covering payment in full for all services rendered, materials furnished and labor supplied or performed. The same Surety must execute both bonds each of which shall be in the form provided in the Contract Documents.

Should any Surety upon any Bond furnished in connection with this Contract become unacceptable or be deemed unsatisfactory to the Owner at any time, the Contractor shall upon written notice from the Owner, promptly furnish acceptable or substitute security as may be required to protect the interests of the Owners or of persons supplying services, labor and materials in the prosecution of the work under Contract. No further payment shall be deemed due or shall be made under this Contract, until the new Surety or Sureties will qualify and be accepted by the Owner.

1.19 INDEMNITY AND INSURANCE

The Contractor shall not commence work under this Contract until he has obtained all insurance required under by these Specifications and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on a subcontract until all similar insurance required of the subcontractor has been so obtained and approved by the Contractor.

- A. Certificates. The Contractor shall submit certificates or other documentary evidences to the Owner for approval, covering Workmen's Compensation Insurance; and Public Liability and Property Damage Insurance as well as any other insurance required by the Contract Documents.

Each certificate or other documentary evidence presented shall contain therein or have contained in a rider attached thereto and made a part thereof, a clause to the effect that the insurer will notify the insured and the Owner in writing thirty (30) days prior to the cancellation of the policy. The certificate for each policy shall be executed in quintuplicate, or in as many copies as the Owner may require.

- B. Accidents and Claims. The Contractor shall be held responsible for all accidents and shall indemnify to the extent permitted by law and protect the Owner from all suits, claims and actions brought against it, and all cost or liability, including attorneys fees, to which the Owner may be put for any injury or alleged injury to the person or property of another resulting from negligence or carelessness in the performance of the work, or from any improper or inferior workmanship, or from inferior materials used in the work.
- C. Mutual Responsibility of Contractors. Should a Contractor in the performance of his/her Contract cause damage to any person, any property, or work of another Owner or other party to the damage, arrange for an amicable settlement thereon. It is agreed by all parties

herein that such disputes shall not delay completion of the work, nor be cause for claim against the Owner. Work shall be continued by the party claiming damages at his expense, subject to such damages as may be obtained by due course of law.

- D. Contractor's Liability. The status of the Contractor in the work to be performed by him/her under this Contract is that of an independent Contractor and that, as such, he shall properly safeguard against any and all injury or damage to the public, to public and private property, materials and things; and that, as such, he/she alone shall be responsible for any and all damage, loss or injury to persons or property that may arise, or be incurred, in or during the conduct or progress of said work without regard to whether or not the Contractor, his/her subcontractors, agents, or employees have been negligent; and that the Contractor shall keep the Owner free, and discharge of, and from any and all responsibility for risks or casualties of every description, for any or all damage, loss or injury to persons or property arising out of the nature of the work, from the action of the elements, or from any unforeseen or unusual difficulty, the Contractor shall assume and be liable for all blame and loss of whatsoever nature by reason of neglect or violation of any federal, state, county, or local laws, regulations or ordinances; that Contractor shall indemnify and save harmless the Owner and all its officers, agents and employees from all suits or actions at law caused by the negligence, recklessness or intentional wrongful misconduct of the Contractor and persons employed or utilized by the Contractor in the performance of the construction contract and shall, if required by the Owner, produce evidence of settlement of any such action before final payment shall be made by the Owner.

1.20 CANCELLATION OF CONTRACT

As soon as practicable after the satisfactory execution of the Contract by both parties, written notice to proceed with the work will be given to the Contractor. If such notice is not given within thirty (30) days after contract execution, and the delay is not caused by the Contractor or accepted by him/her in writing, the Contract may be declared null and void by either party.

If the Contractor incurs any expense in furtherance of the Contract prior to receipt of the Notice to Proceed, he/she does so on his own responsibility.

1.21 COMPLETION TIME AND LIQUIDATED DAMAGES

The Bidder shall understand that the time limit indicated for completion of this Contract, and the amount of liquidated damages to be charged against the Contractor shall be declared in default in accordance with the provisions of the Specifications, shall be as stated in Article II of the Form of Agreement which is a part of these Contract Documents.

1.22 PAYMENT OF TAXES

The Contractor will be responsible for payment of all Excise, Sales and Use Taxes, and all other taxes required by law on all materials, tools, apparatus, equipment, fixtures, and incidentals which he purchases or uses for the purpose of fulfilling the work of this Contract, and he/she shall include all amounts required for such taxes with the item prices bid in his Proposal. No additional payment

will be made to cover such taxes. Each Bidder shall thoroughly familiarize himself before submitting a Proposal, with all laws requiring the payment of taxes.

1.23 PUBLIC ENTITY CRIMES INFORMATION STATEMENT

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount, provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

1.24 PROHIBITION OF GIFTS TO CITY EMPLOYEES

No organization or individual shall offer or give, either directly or indirectly, any favor, gift, loan, fee, service or other item of value to any City employee, as set forth in Chapter 112, Part III, Florida Statutes, the current City Ethics Ordinance, and City Administrative Policy. Violation of this provision may result in one or more of the following consequences: a. Prohibition by the individual, firm, and/or any employee of the firm from contact with City staff for a specified period of time; b. Prohibition by the individual and/or firm from doing business with the City for a specified period of time, including but not limited to: submitting bids, ITB, and/or quotes; and, c. immediate termination of any contract held by the individual and/or firm for cause

1.25 PROTEST PROCEDURES

Any appeal or protest to the Request for Bid shall be governed by the City of Holly Hill's Purchasing Policies and Procedures shown in Resolution 2018-30. A copy of his resolution is available by request to the City Clerk.

1.26 IMMIGRATION REFORM AND CONTROL ACT

Proposer acknowledges, and without exception or stipulation, any firm(s) receiving an award shall be fully responsible for complying with the provisions of the Immigration Reform and Control Act of 1986 as located at 8 U.S.C. 1324, et seq. and regulations relating thereto, as either may be amended. Failure by the awarded firm(s) to comply with the laws referenced herein shall constitute a breach of the award agreement and the City shall have the discretion to unilaterally terminate said agreement immediately.

1.27 NO LOCAL VENDOR PREFERENCE

Local vendor preference is prohibited for projects that are funded from Federal sources. Therefore no local vendor preference will be given on this project bid.

END OF SECTION

**SECTION 00 30 00
PROPOSAL
FOR
CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
BID NO. 20-WW-01**

(To be completed in Duplicate)

Bidder's Name: _____

Submitted: _____, 20

City of Holly Hill
City Clerk
1065 Ridgewood Avenue
Holly Hill, FL 32117

Gentlemen:

The undersigned, as Bidder, hereby declares that the only person or persons interested in the Proposal, as principal or principals, is or are named herein and that no other persons than herein mentioned has any interest in the Proposal or the Contract to which the work pertains; that this Proposal is made without connection or arrangement with any other person, company, or parties making a bid or proposal and that the Proposal is in all respects fair and made in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and that from personal knowledge and experience, or that he/she has made sufficient test holes and/or other subsurface investigations to fully satisfy self that such site is a correct and suitable one for this work and he/she assumes full responsibility therefore; that he/she is familiar with all legal requirements (Federal, State and local laws, ordinances, rules and regulations) pertaining to the Work; that he/she has examined the Drawings and Specifications for the work and from his/her own experience or from professional advice that the Drawings and Specifications are sufficient for the work to be done and he/she has examined the other Contract Documents and all addenda relating thereto, and that he/she has satisfied himself/herself fully, relative to all matters and conditions with respect to the work to which this Proposal pertains.

The Bidder proposes and agrees, if this Proposal is accepted, to contract with the City of Holly Hill, (Owner) in the form of contract specified, to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, and labor and to perform all work necessary to complete the Work specified in the Proposal and other Contract Documents.

The Bidder further proposes and agrees to comply in all respects with the time limits for commencement and completion of the Work as stated in the Contract Form.

The Bidder further agrees that the deductions for liquidated damages, as stated in the Contract Form, constitute fixed and agreed liquidated damages to reimburse the Owner for additional costs to the Owner resulting from the Work not being completed within the time limit stated in the Contract Form.

The Bidder further agrees to execute a Contract and furnish satisfactory Performance and Payment Bonds, each in the amount of one-hundred percent of the Contract price, and the required Certificates of Insurance, within ten consecutive calendar days after written notice being given by the Owner of the award of the Contract, and the undersigned agrees that in case of failure on his/her part to execute the said Contract, Performance and Payment Bonds and Insurance Certificates within ten (10) consecutive calendar days after the award of the Contract, the bid guarantee accompanying his/her bid and the money payable thereon shall be paid to the Owner as liquidation of damages sustained by the Owner; otherwise, the bid guarantee shall be returned to the undersigned within fifteen days after the Contract is signed and the Performance and Payment Bonds and Insurance Certificates are filed.

The undersigned agrees to accept as full compensation for completion of the project in full compliance with the Contract Documents, the unit prices for the items named in Section 00 31 00, Schedule of Unit Prices, submitted herein with this Proposal.

The undersigned offers to furnish all materials, equipment and labor for construction of,

LIFT STATION #9 REPLACEMENT

for the City of Holly Hill, Florida, complete in every respect in strict accordance with the drawings, specifications and any future changes therein. The Contractor shall perform these obligations for the prices listed in the "Schedule of Unit Prices: Section 00 31 00" attached and made a part of this Bid. **The bid total is:**

(In Words)

Dollars \$_____ (In Figures)

COMPLETION TIME OF CONTRACT

The Contractor agrees that the work shall be started not later than the date indicated in the Notice to Proceed and that the total work shall be substantially completed within **150 days** and final completion within **30 days** of substantial completion.

The Contractor further agrees that for each calendar day, with the exception of Sundays and legal holidays that any work shall remain uncompleted after the stations completion times stipulated above the sum of **\$500 (Five Hundred Dollars)** per day shall be deducted from monies due the

contractor, not as a penalty, but as liquidated damages. If the Contractor is declared in default in accordance with the provisions of the Specifications, liquidated damages shall be charged as provided herein, and such amounts shall be deducted from the final amount payable to the Contractor or his/her Surety. Should the total amount chargeable as liquidated damages exceed the amount due or payable to the Contractor or his/her Surety, then such excess shall be paid to the Owner by the Contractor or his/her Surety.

SUPPLEMENTAL REQUIREMENTS

The following documents are attached to and made a condition of this bid:

Schedule of Unit Prices: Section 00 31 00
 Statement of Bidder's Qualifications: 00 32 00
 Listing of Subcontractors: Section 00 33 00
 Listing of Previous Experience: Section 00 33 10
 Bid Bond: Section 00 41 00
 Public Entity Crimes Statement: Section 00 47 00
 Anti-Collusion Statement: Section 00 48 00
 Drug Free/Tie Preference Statement: Section 00 48 50
 Trench Safety Affidavit: Section 00 49 00
 Certificate as to Corporate Principal: Section 00 62 00
 City of Holly Hill Insurance Requirements: Section 00 80 00A
 W9 Request for Taxpayer Identification Number and Certification

REQUIRED DISCLOSURE

At its sole discretion, the City of Holly Hill, Florida may reject any bidder the City finds to lack, or whose present or former executive employees, officers, directors, stockholders, partners or owners are found by the City to lack honesty, integrity, or moral responsibility. The discretion of the City may be exercised based on the City's own investigation, public records, or any other reliable sources of information. By submitting a bid, bidder recognizes and accepts that the City may reject the bid based upon the exercise of its sole discretion and bidder waives any claim it might have for damages or other relief resulting from the rejection of its bid based on these grounds.

SCHEDULE OF MAJOR MANUFACTURERS AND SUPPLIERS

The equipment manufacturers/suppliers on this project shall be as delineated in the following schedule. Bidders should note that the Owner and Engineer have made rigorous investigations of equipment performance and features, and as a result, Bidders are to note that the contract price for this project shall be based on Base Bid equipment. The Base Bid equipment for this project falls under one of two categories. The first category is equipment that the Owner and Engineer have determined will be supplied by a sole source of supply, for which no substitutions or alternates will be entertained or allowed. Bidder is advised that offering of any alternatives to the sole source supplied equipment will be grounds for rejection of his bid as not responsive. The second category of equipment includes those items where the Owner and Engineer deem there to be more than one acceptable supplier of the particular item listed. The equipment which falls under these two categories is shown on the subsequent pages of this Schedule of Major Manufacturers and

Suppliers. Bidder is advised that the award of this Contract will be based solely on the use of Base Bid equipment.

The following comments relate only to the second category of equipment, where the Contract Documents are based upon the equipment or products available from the suppliers denoted as A, B, C, etc. below. These equipment manufacturers, along with the sole source suppliers constitute the Base Bid.

Provision is made in the Contract Documents for alternate manufacturers and suppliers whose equipment or product may be deemed equivalent in quality (see General Conditions). However, the Bidder must indicate in his Bid which Base Bid supplier he intends to use for each item of equipment listed by circling one of the listed manufacturers/suppliers. If the Bidder fails to indicate which listed manufacturer/supplier he intends to use if an alternate is rejected, he must use the supplier listed as "A". Also, if the Bidder circles more than one listed supplier, he must use the first supplier circled (unless an alternate is approved).

If the Bidder desires to propose one or more alternate manufacturers/suppliers, he may write in the name of such alternates in the spaces provided on the Alternate Manufactures/Suppliers page following the schedule. He must, nevertheless, also circle one of the listed manufacturers/suppliers because Bidders' Bid price must be based upon this Base Bid list. Wherever an alternate supplier is proposed, the Bidder must insert the amount to be deducted from the Contract Price (either lump sum or unit price) if the alternate supplier is eventually approved. If the proposed alternate supplier is determined "not equivalent" by the Engineer, the Bidder must use the circled supplier.

For any alternate supplier accepted by the Owner, the Contract Price will be reduced by the deductive amount stated in the Bid. However, the Contract Price will not be adjusted for any alternate supplier rejected.

Each proposed alternate will be evaluated in accordance with the General Conditions.

The deductive amount specified for alternate manufacturers/suppliers will not be used in determining the successful Bidder. Alternates will be considered only after award of the contract.

The Contractor shall reimburse the Owner for any costs directly attributable to the change in suppliers, such as additional field trips for the Engineer, additional redesign costs, additional review and inspection costs, etc.

The Owner may request and the Bidder shall supply complete information on proposed alternates prior to the Notice of Award.

SCHEDULE OF MAJOR MANUFACTURERS
AND SUPPLIERS

Category I - Sole Source Equipment Items:

Item No.	Spec. No.	Equipment/Material	Manufacturer or Supplier

Category II - Major Equipment Items:

ALTERNATE MANUFACTURERS/SUPPLIERS

EQUIPMENT ITEM MATERIAL	SPEC. SECTION	ALTERNATIVE MANUFACTURER / SUPPLIER (LIST ONE ONLY)	DEDUCTIBLE AMOUNT (indicate whether lump sum or unit price) ALTERNATE
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____

Name (signature)

Date

Name (typed and printed)

Title

ACKNOWLEDGMENT OF ADDENDA

Addenda will be issued via email and it is the Bidder's responsibility to confirm that all addenda have been received prior to submitting a bid for the project. Acknowledgment is hereby made of the following Addenda received since issuance of Drawings and Specifications:

Addendum No. _____	Dated: _____	Addendum No. _____	Dated: _____
Addendum No. _____	Dated: _____	Addendum No. _____	Dated: _____
Addendum No. _____	Dated: _____	Addendum No. _____	Dated: _____

Attached hereto is a cashier's check on the _____ Bank of
 _____ or Bid Bond for the sum of
 _____ Dollars (_____),
 made payable to _____ (Owner).

 (Name of Bidder) (Affix Seal)

 (Signature of Officer)

 (Title of Officer)

 Name of Bidder

 Address

 City/State/Zip

 Telephone

 Contractor's Florida License Number

The full names and residences of persons and firms interested in the foregoing bid, as principals, are as follows:

END OF SECTION

**SECTION 00 31 00
SCHEDULE OF UNIT PRICES
CITY OF HOLLY HILL**

**LIFT STATION #9 REPLACEMENT
BID NO. 20-WW-01**

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
A.	PRELIMINARY ITEMS				
1	Mobilization	1	LS		
2	Erosion and Sediment Control	1	LS		
3	Preconstruction Video	1	LS		
4	Field Locate and Expose Existing Utilities	1	LS		
B.	LIFT STATION				
1	Bypass Pumping	1	LS		
2	Demolition	1	LS		
3	Complete Lift Station	1	LS		
4	Electrical	1	LS		
5	Gate Valve - 6" RS	1	EA		
6	Force Main - 6" C900 PVC w/fittings	10	LF		
7	Tie-Ins				
	a) Tie-In to Existing Force Main	1	LS		
8	DIP Fittings Add or Delete	10	LB		
9	Permits and Allowances	1	LS	\$5,000	\$5,000
10	Lift Station As-Built Plans	1	LS		
11	Open Cut and Repair Asphalt	10	SY		
C.	GENERAL				
1	Concrete Pavement, Remove and Replace				
	a) 4" Thick Sidewalk	50	SY		
	b) 6" Thick Driveway/Pavement	10	SY		
2	Sod - Argentine Bahia	100	SY		
3	Compliance with Florida "Trench Safety Act"	1	LS		
4	Unsuitable Material Excavation	1	CY		
5	Crushed Rock or Shell Trench Subgrade Material	1	CY		
6	Rock Excavation	1	CY		
BASE BID TOTAL					

Submitted by: _____

Contractor: _____

Address: _____

Telephone: _____ Fax: _____

State of Florida Certified General Contractor or Underground Contractor (Required Information)

Licensee: _____ License No: _____

Attachment: HH Lift Station #9 Replacement_Bid Set Specifications_02.21.20 (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of

SECTION 00 32 00

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The bidder may submit any additional information he desires.

- A. Name of bidder.
- B. Permanent main office address.
- C. When organized.
- D. If a corporation, where incorporated.
- E. How many years have you been engaged in the contracting business under your present firm or trade name?
- F. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
- G. General character of work performed by your company.
- H.⁽¹⁾ Have you ever failed to complete any work awarded to you? If so, where and why?
- H.⁽²⁾ Provide list of any lawsuits or judgments filed by or against your company in the last three years, indicating the nature and outcome.
- I. Have you ever defaulted on a contract? If so, where and why?
- J. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.
- K. List your major equipment _____.
- L. Experience in construction work similar in type to this project.
- M. Background and experience of the principal members of your organization, including the officers.
- N. Credit available: \$ _____
- O. Give bank reference: _____
- P. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner?

- Q. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at _____ this _____ day of _____, 20____.

Name of Bidder

By: _____
Title

State of _____

County of _____

_____ being duly sworn deposes and says that

he is the _____ of _____ and that

the answers to the _____ foregoing questions
Name of Organization

and all statements therein contained are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public

Notary Public (Print or Type)

My commission expires: _____

SECTION 00 33 00
LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. Upon approval of subcontractors listed the successful bidder shall not substitute subcontractors without approval from the Engineer. Bidder shall attach additional sheets as necessary.

SUBCONTRACTOR	COMPANY NAME	REFERENCES
		1) 2) 3)
		1) 2) 3)
		1) 2) 3)
		1) 2) 3)

END OF SECTION

SECTION 00 33 10
LISTING OF PREVIOUS EXPERIENCE

The bidder proposes that he/she is qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. A minimum of three (3) projects must be listed below. The Owner reserves the right to check references and confirm information provided herein.

NO.	PROJECT	OWNER	DESCRIPTION/COST	REFERENCE	DATE WORK STARTED & FINISHED MM/YR TO MM/YR
1					
2					
3					

END OF SECTION

**SECTION 00 41 00
BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as Principal and _____ of the City of _____ State of _____, a corporation existing under the laws of the State of Florida, as Surety, are held and firmly bound unto the _____ hereinafter called the Owner, in the sum of _____ Dollars (\$ _____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

The condition of this obligation is such that whereas the Principal has submitted the accompanying Proposal or Bid, for the construction of:

LIFT STATION #9 REPLACEMENT

NOW, THEREFORE, if the Principal shall not withdraw said Bid within ninety (90) days after the opening of the same and in the event of the acceptance of his proposal by the Owner, shall, within the period specified therefore, enter into a written contract with the Owner in accordance with the Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, or in the event of the withdrawal of said Bid within the period specified, of the failure to enter into such contract and give bonds within the time specified, if the Principal shall pay the Owner the difference between the amount specified in said Bid and the amount for which the Owner may procure the required work, if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this ____ day of _____, 20__, the name and corporate seal of each corporate body being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

IN PRESENCE OF:

_____(Seal)
 _____(Seal)
 _____(Seal)
 Individual or Partner

Witness

ATTEST:

 Address

 Corporate Principal

 President AFFIX
 CORPORATE SEAL

ATTEST:

 Address
 By _____
 AFFIX
 CORPORATE SEAL

 Corporate Surety

 Title

END OF SECTION

SECTION 00 47 00

SWORN STATEMENT UNDER SECTION 287.133(3)(a), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES:

This sworn statement is submitted with Bid, Proposal **or** Contract No. _____ for _____.

This sworn statement is submitted by _____ whose business address is _____ and (if applicable) its Federal Employer Identification Number (FEIN) is _____. (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)

My name is _____ any my relationship to the entity named above is _____.

I understand that a "public entity crime" as defined in Paragraph 287.133(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

I understand that "convicted" or "conviction" as defined in Paragraph 287.133(i)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

I understand that an "affiliate" as defined in Paragraph **287.133(l)(a)**, Florida Statutes, means:

1. A predecessor or successor of a person convicted of a public entity crime: or
2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie that one person controls another person. A person who knowingly enters into a joint venture with a

person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

I understand that a "person" as defined in Paragraph 287.133(i)(e), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies).

- _____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- _____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND (Please indicate which additional statement applies.)
- _____ There has been a proceeding concerning the conviction before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)
- _____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order).

(Signature) _____ Date: _____

State of _____ County of _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, _____
 who, after first being sworn by me, affixed his/her signature in the space provided above on this
 _____ day of _____, 20__.

 Notary Public

My Commission Expires:

**SECTION 00 48 00
ANTI-COLLUSION STATEMENT**

By signing this form, the bidder agrees that this is made without any other understanding, agreement, or connection with any person, corporation, or firm submitting a proposal for the same purpose and that the proposal is in all respects fair and without collusion or fraud.

SIGN in ink in the space provided below. Unsigned bids will be considered incomplete, and will be disqualified, and rejected.

IT IS AGREED BY THE UNDERSIGNED BIDDER THAT THE SIGNING AND DELIVERY OF THE BID REPRESENTS THE BIDDER'S ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE FORGOING SPECIFICATIONS, CONTRACT AND PROVISIONS, AND IF AWARDED, THIS CONTRACT WILL REPRESENT THE AGREEMENT BETWEEN EACH OF THE GOVERNMENTAL PARTIES.

NAME OF FIRM: _____

SIGNED BY: _____
(MUST BE SIGNED BY A COMPANY OFFICER OR AUTHORIZED AGENT)

TITLE: _____

ADDRESS: _____

CITY AND STATE: _____

TELEPHONE: _____

COMPLETION TIME: _____

NO proposals will be withdrawn for a period of ninety (90) days subsequent to the opening of the proposals, without the consent of the City of Holly Hill.

NO BID (REASON) _____

END OF SECTION

SECTION 00 48 50 DRUG FREE/TIE PREFERENCE STATEMENT

In the event of a tie bid a preference is given to vendors submitting a certification with their bid/proposal certifying they have a drug-free workplace in accordance with Section 287.087, Florida Statutes. This requirement affects all public entities of the State and becomes effective January 1, 1991. The special conditions are as follow:

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the State or by any political subdivision for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction or, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfaction participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

VENDOR'S SIGNATURE

END OF SECTION

SECTION 00 49 00
TRENCH SAFETY AFFIDAVIT

Trench excavations on this Project are expected to be in excess of 5 feet deep. The Occupational Safety and Health Administration excavation safety standards, 29 CFR 1926.650 Subpart P trench safety standards will be in effect during the period of construction of the Project.

Bidder acknowledges that included in the Bid Price are costs for complying with the Florida Trench Safety Act (90-096, Laws of FL) effective October 1, 1990, and hereby gives assurance that, if awarded the Contract, the Contractor or Subcontractor performing trench excavation work on the Project will comply with the applicable trench safety standards. The Bidder further identifies the costs as follows:

<u>Trench Safety Item (Description)</u>	<u>Cost</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(Cost in Words)

TOTAL \$ _____

FAILURE TO COMPLETE THE ABOVE SHALL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE

COMPANY NAME: _____

DATE: _____ BY: _____

(Additional sheets shall be attached, as needed and, items shall be organized to correspond with the bid format)

SECTION 00 50 00

AGREEMENT

THIS AGREEMENT, entered into this ____ day of _____, 20__, by the City of Holly Hill, Florida, hereinafter called the OWNER, Party of the First Part, and a CORPORATION known as _____ organized and existing under the laws of the State of _____; PARTNERSHIP known as _____ consisting of the following members: _____ an INDIVIDUAL _____ trading as _____ of _____ City _____ State of _____ Zip Code _____, hereinafter called the CONTRACTOR, Party of the Second Part.

WITNESSETH: That the parties hereto do mutually agree as follows:

ARTICLE I.

- A. The Contractor agrees to furnish all labor, materials, equipment for:

LIFT STATION #9 REPLACEMENT

herein called for, in strict accordance with the Drawings and Specifications prepared by Mead & Hunt, Engineers, which Contract include, but is not limited to, the following Contract Documents:

- | | |
|---------------------|------------------------------------|
| a. Invitation | f. Labor and Material Payment Bond |
| b. Instructions | g. Insurance |
| c. Proposal | h. Specifications |
| d. This Agreement | i. Addenda (if any) |
| e. Performance Bond | j. Drawings |

ARTICLE II.

- A. The Contractor agrees that the work shall be started not later than the date indicated in the Notice to Proceed and that all work shall be completed within **150 days with an additional 30 days for final completion.**
- B. The Contractor further agrees that for each calendar day, with the exception of Sundays and legal holidays, which any work shall remain uncompleted after the stations completion times stipulated above, the sum of **\$1000 (ONE THOUSAND DOLLARS)** shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages. If the Contractor is declared in default in accordance with the provisions of the Specifications, liquidated damages shall be charged as provided herein, and such amounts shall be deducted from the final amount payable to the Contractor or his Surety. Should the total

amount chargeable as liquidated damages exceed the amount due or payable to the Contractor or his Surety, then such excess shall be paid to the Owner by the Contractor or his Surety.

ARTICLE III.

- A. The Contractor shall receive and accept the compensation for the performance of the Contract (subject to additions or deductions noted therein) in accordance with the prices stipulated in the Proposal, and in the manner provided in Article IV for the Contract Price of \$_____ and for additions or revisions approved in Change Orders at Unit Prices.

ARTICLE IV.

- A. Payment to the Contractor shall be made as follows:
1. Not later than the fifteenth (15th) day of each calendar month, the Owner will make a partial payment to the Contractor on the basis of a duly certified and approved estimate by the Engineer of the work performed during the preceding calendar month under this Contract, and (at the option of the City) an amount equal to 90% of materials and equipment not incorporated in the work but delivered and suitably stored. When payment to the Contractor is made for stored materials and equipment, Contractor shall submit invoices marked paid by the supplier with the next month's request for payment to document that Contractor has paid for said materials and equipment or the previously paid amount for stored materials shall be deducted from any remaining payment(s) for any stored materials not so properly documented. To insure the proper performance of this Contract, the Owner will retain ten percent (10%) of the amount of each estimate until the work is fifty percent (50%) complete.
 2. When work is fifty percent (50%) complete, the Owner may allow the reduction of the withholding to five percent (5%) of the dollar value of all work satisfactorily completed to date, provided that the Contractor is making satisfactory progress and there is no specific cause for greater withholding.
 3. Upon completion of the entire work under Contract, the Engineer shall make a final inspection and certify such completion to the Owner. Upon approval of the completion certificate by the Owner, the Owner shall notify the Contractor and the Surety of the satisfactory completion of the work and except as otherwise provided in the Specifications, final payment therefore shall be made to the Contractor within thirty (30) days after written acceptance by the Contractor of the final certificate computation.

ARTICLE V.

- A. The Contract shall not sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or his right, title or interest therein, without written consent of the Owner.

ARTICLE VI.

- A. The work shall be subject at all times to the supervision of the Engineer and his authorized assistants. The Engineer shall decide all questions which may arise relative to the Drawings, Specifications, and the performance of the work. Any doubt concerning the meaning of the Specifications and the Drawings, or any ambiguity or obscurity as to wording or intent of them shall be decided by the Engineer, and such decisions shall be binding upon both parties hereto, and shall not be subject to arbitration.

ARTICLE VII.

- A. The Contractor shall guarantee his work and shall remedy, without cost to the Owner, any defects which may develop therein during a period of one (1) year from the date of the Owner's approval of the Completion Certificate issued by the Engineer.

ARTICLE VIII.

- A. In the event of conflict between any of the Contract Documents, the provisions of this Agreement shall govern.

IN WITNESS WHEREOF, the Parties hereto have signed this Contract in quintuplicate the day and year first above written.

ATTEST:

CITY OF HOLLY HILL, FLORIDA

Valerie Manning

By _____
Joseph A. Forte

Title City Clerk

Title City Manager

WITNESS:

CONTRACTOR

By _____

END OF SECTION

SECTION 00 62 00
CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____
of the corporation named as Principal in the within Bid Bond; that _____
who signed the said Bid Bond on behalf of the Principal was then _____
of said corporation; that I know his signature, and his signature thereto is genuine; and that said
Bid Bond was duly signed, sealed and attested for in behalf of said corporation by authority of its
governing body.

AFFIX CORPORATE SEAL

END OF SECTION

Return Recorded Document to:
City Clerk
1065 Ridgewood Avenue
Holly Hill, FL 32117

LIFT STATION #9 REPLACEMENT

Name of Project

City Project No. 20-WW-01

Bond No. _____

Space Reserved for Recording Data

COMBINATION PAYMENT AND PERFORMANCE BOND FOR

PUBLIC CONSTRUCTION

*per Section 255.05, Florida Statutes (2010)
Guaranty for Construction of Public Improvements*

BY THIS BOND, We, _____, as Principal, and _____, a corporation, as Surety, are bound to **CITY OF HOLLY HILL, FLORIDA**, a municipal corporation, herein called Owner or sometimes referred to as "City," in the sum of _____ and /100 Dollars (\$ _____), for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the terms of that certain Contract having an effective date of _____, entered into by and between the Principal and the City, hereinafter sometimes referred to as the Contract, entered into between Principal and Owner for construction of improvements reflected on the plans approved by the City Council, as prepared by Andrew M. Giannini, P.E., Florida Registration No. 46601, of the engineering firm Mead & Hunt, the "Contract," being made a part of this bond by reference, at the times and in the manner prescribed in the Contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract (the "Work"); and
3. Pays Owner all losses, damages, delay damages (including contractually authorized liquidated damages), expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a breach or material breach by Principal under the Contract Documents; and
4. Performs the guarantee of all work and materials furnished under the Contract for the time specified in the Contract, then this bond is void; otherwise it remains in full force.

Notice of Nonpayment and Time Limitations

Pursuant to Florida Statutes Section 255.05, as amended from time to time, a claimant, except a laborer, who is not in privity with the Principal, shall, before commencing or not later than forty-five (45) days after commencing to furnish labor, materials, or supplies for the prosecution of the Work, furnish the Principal with a notice that he or she intends to look to this bond for protection. A claimant who is not in privity with the Principal and who has not received payment for his or her labor, materials, or supplies shall deliver to the Principal and to the Surety written notice of the performance of the labor or delivery of the materials or supplies and of the nonpayment. The notice of nonpayment may be served at any time during the progress of the Work or thereafter but not before forty-five (45) days after the first furnishing of labor, services, or materials by the claimant or, with respect to rental equipment, not later than ninety (90) days after the date that the rental equipment was last on the job site

available for use. No action for the labor, materials, or supplies may be instituted against the Principal or the Surety unless both notices have been given. Notices required or permitted under this section may be served in accordance with Section 713.18, Florida Statutes. An action, except for an action exclusively for recovery of retainage, must be instituted against the Principal or the Surety on this bond within one (1) year after the performance of the labor or completion of delivery of the materials or supplies. An action exclusively for recovery of retainage must be instituted against the Principal or the Surety within one (1) year after the performance of the labor or completion of delivery of the materials or supplies, or within ninety (90) days after receipt of final payment (or the payment estimate containing the Owner's final reconciliation of quantities if no further payment is earned and due as a result of deductive adjustments) by the Principal or Surety, whichever comes last.

Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond.

IN WITNESS WHEREOF, this performance and payment bond is executed in duplicate originals, each of which shall be deemed an original, this _____, day of _____, 20____.

Attest:

(Name of Principal)

(As to Corporate Principal) Secretary

By: _____

Name/Title: _____

(Witness to Principal)

(Corporate Seal)

(Surety)

(Witness to Surety)

By: _____

(Attorney-In-Fact)

(Corporate Seal)

NOTE: Date of BOND must not be prior to date of Contract. If Developer/Principal is Partnership, all partners should execute BOND. All BONDS signed by an agent must be accompanied by a certified copy of the authority to act.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Florida.

SECTION 00 64 00

Front Page for Bond required by Section 255.05, F.S

PAYMENT AND PERFORMANCE BOND

(Public Works)

Notice and Time Limitations Must Be In Accordance
With Section 255.05 Florida Statutes (2010)**BOND No.** _____**PRINCIPAL:**

Name of Developer/Contractor: _____

Address: _____

Contact Person: _____

Phone Number: () _____ - _____

SURETY:Address: _____

Contact Person: _____

Phone Number: () _____ - _____

OWNER:City of Holly Hill, Florida, a chartered municipal corporation
1065 Ridgewood Avenue
Holly Hill, FL 32117

Contact Person: City Manager

Phone Number: (386) 248-9463

Amount: \$ _____**City Case/Project No.** 20-WW-01

Description of Work: *The replacement includes the conversion of the can lift station into a submersible station. Work includes bypass pumping, demolition of (2) existing pumps, piping, and valves to abandon pump can. Installation of two (2) new submersible pumps, top slab, piping, valves, valve vault, electrical panel and control panel.*

Project Location: Holly Hill, Volusia County, Florida**Legal Description:** City Right-of-Way or Easement.Front Page

All other pages are subsequent to this page regardless of any numbers that may be printed thereon.

Certificate for Filing in Public Records**PAYMENT AND PERFORMANCE BOND**

(Public Works)

In Compliance with Section 255.05(1)(a) Florida Statutes (2010)

Bond No. _____

The Principal, _____
 by and through its undersigned representative, does hereby certify that the attached:

Payment and Performance Bond No. _____,
 is a true and correct copy of the fully executed financial guarantee delivered to:

CITY OF HOLLY HILL, FLORIDA

pursuant to Section 255.05, Florida Statutes (2010); as Owner/Holder of the subject property in trust for the public, for the public construction project known as:

LIFT STATION #9 REPLACEMENT

located in Holly Hill, Volusia County, Florida, and identified by the City of Holly Hill as Case No. 20-WW-01.

All claimants are called upon to take notice of the notice requirements and time limitations prescribed by Section 255.05(2), Florida Statutes (2010).

_____ a Florida _____
 Mailing Address: _____

By: _____
 Name/Title: _____

STATE OF FLORIDA
 COUNTY OF VOLUSIA

The foregoing Certificate of Filing was acknowledged before me this _____ day of _____, 20____, by _____ as a duly authorized representative of _____ a Florida _____, the Principal named in the attached **Payment and Performance Bond No.** _____.

Notary, please check one:

_____ Personally known to me
 _____ Produced identification

 Notary Public, State of Florida

My Commission Expires: _____

Printed Name: _____

**SECTION 00 65 00
CERTIFICATE OF INSURANCE
FOR
PUBLIC LIABILITY AND PROPERTY DAMAGE**

This is to certify _____ Company has
issued to _____, of the City of _____, State of _____,
the following policy or policies; Public Liability Policy No. _____ effective on _____,
20____, limits _____,
Property Damage Policy No. _____ effective on _____, 20____, and expiring
on _____, 20____, limits _____.

If at any time this coverage is to be canceled, the undersigned will notify the insured and _____,
in writing thirty (30) days prior to cancellation of
the policy.

(This certificate must be made by a duly authorized official of the Insurance Company carrying the risk, or a separate certificate of similar context executed on Insurance Company's Standard Form may be attached hereto.)

END OF SECTION

SECTION 00 66 00
AFFIDAVIT REGARDING WORKMEN'S COMPENSATION

State of _____

County of _____

_____ being duly sworn according to law, deposes and says (it, he, they) ha__ accepted the Workmen's Compensation laws of the State of Florida, with its supplements and amendments and has insured (its, his, their) liability there under in accordance with the terms of said Laws with the _____ Company, under the terms of Policy No. _____ for a period from _____, 20 to _____, 20 ____.

WITNESS:

CONTRACTOR:

By _____

Title _____

Sworn to and subscribed before me this ____ day of _____, 20____.

Notary Public

Notary Public (Print or Type)

My Commission Expires: _____

END OF SECTION

**SECTION 00 66 50
CERTIFICATE OF INSURANCE
FOR
WORKMEN'S COMPENSATION**

This is to certify that _____, Company has issued
to _____, of the City of _____, State of _____,
the following policy or policies: Workmen's Compensation and Employer's Liability Policy No. _____
effective on _____, 20 _____.
re _____ Policy No. _____
effective on _____, 20 ____ and expiring on _____, 20 ____
re _____ limits _____.

If at any time this coverage is to be canceled, the undersigned will notify the insured and
the _____ in writing thirty (30) days
prior to cancellation of policy.

(This certificate must be made by a duly authorized official of the Insurance Company carrying
the risk, or a separate certificate of similar context executed on Insurance Company's Standard
Form may be attached hereto.)

END OF SECTION

SECTION 00 67 00
CONTRACTOR'S STATEMENT UNDER OATH, TO OWNER

To: _____

The undersigned as Contractor has heretofore, on the ____ day of _____, 20 __, has been awarded a Contract by you, as Owner, to furnish all the materials and labor in the construction of a project entitled: _____
 for the Contract Price of _____ in accordance with plans and specifications therefore as prepared by Mead & Hunt, P.O. Drawer 290247, 4401 Eastport Parkway, Port Orange, Florida 32129-0247.

Said project has been completed and the Contract and Plans therefore fully complied with and all of the Contract Price has been paid by you, except the Final Payment thereon, which is now due, but is being withheld until a sworn statement is furnished, as required by _____ showing whether there are any unpaid and outstanding bills in connection with said Project.

The undersigned hereby certified, under oath, that all lienors contracting directly with or directly employed by the undersigned, on said Contract, have been paid in full, and further certifies, under oath, that there are no outstanding or unpaid bills for labor performed, or materials furnished in connection with said work or improvements.

Dated at _____ this ____ day of _____, 20____.

By _____
 Contractor

Title _____

State of _____

County of _____

Sworn to and subscribed before me this ____ day of _____, 20 ____.

 Notary Public

My Commission Expires: _____

END OF SECTION

**SECTION 00 68 00
RECEIPT AND RELEASE**

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned _____ of _____ was heretofore, on _____, 20 __, award a Contract by _____ for the Contract Price of _____ to furnish all the materials and labor in the construction of a project entitled:

LIFT STATION #9 REPLACEMENT

in accordance with the plans and specifications therefore, as prepared by Mead & Hunt Company, Engineers, and the undersigned has completed said work and fully complied with said Contract and has heretofore received the sum of \$ _____ as payment thereon.

That the undersigned has this date received from _____ the sum of \$ _____, representing the full balance due _____, as Contractor, under the terms of said Contract, and certified that said Contract has been fully performed in accordance with the terms thereof, and that _____ has paid in full all persons furnishing labor and/or materials in connection therewith, including all subcontractors and suppliers, and that there are no unpaid bills for labor performed or materials furnished in connection with said work or improvements.

That the undersigned, for value received, does hereby forever release and discharge the said _____ as described in the said Contract, from any and all liens, claims or demands whatsoever that _____ has or may have for work performed or materials furnished thereon by any subcontractor or supplier and that will hold harmless the _____ from any and all loss and liability arising or to arise by reason of any unpaid bills for labor performed or materials furnished on said project in connection with said work or improvements. This document is only binding upon receipt of a check for the above balance due.

IN WITNESS WHEREOF, the undersigned has hereto set ____ hand and seal this _____ day of _____, 20 ____.

Witnessed by:

CONTRACTOR

By _____

Title _____

State of _____

County of _____

Before me, the undersigned authority, personally appeared _____, to me well known and known to me to be the person described in and who executed the foregoing instrument, and he acknowledged before me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this ____ day of _____, 20 ____.

My Commission Expires:

Notary Public, State of Florida

END OF SECTION

Attachment: HH Lift Station #9 Replacement_Bid Set Specifications_02.21.20 (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of

**SECTION 00 69 00
CONSENT OF SURETY
For Final Payment**

Project Name: **LIFT STATION #9 REPLACEMENT**

Location _____

Project No. _____ Contract No. _____

Type of Contract _____

Amount of Contract _____

In accordance with the provisions of the above-named contract between the Owner and the Contractor, the following named surety: _____

on the Payment Bond of the following named Contractor: _____

hereby approves of final payment to the Contractor, and further agrees that said final payment to the Contractor shall not relieve the Surety Company named herein of any of its obligations to the following named Owner, as set forth in said Surety company's bond: _____.

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand and seal this day of _____, 20 ____.

(Name of Surety Company)

(Signature of Authorized Representative)

(Affix Corporate Seal)

TITLE

END OF SECTION

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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(703) 684-2882
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American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

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requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;
- then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.
- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

- Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
 - F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
 - G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
 - H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
 - I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
 - J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
 - K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 Contractor's Insurance

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
- 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
- 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 1. Observations by Engineer;
 - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. Use or occupancy of the Work or any part thereof by Owner;
 - 5. Any review and approval of a Shop Drawing or Sample submittal;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

- B. *Change Proposal Procedures*

1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
- 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 6. Expenses incurred in preparing and advancing Claims.
- 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:* Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance:* Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 Defective Work

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.
- D. *Payment Becomes Due***
1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.
- E. *Reductions in Payment by Owner***
1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 1. correct the defective repairs to the Site or such adjacent areas;
 2. correct such defective Work;
 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

EJCDC® C-700, Standard General Conditions of the Construction Contract.

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provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**SECTION 00 70 50
RELEASE OF ALL CLAIMS**

STATE OF _____

COUNTY OF _____

CITY OF _____

KNOW ALL MEN BY THESE PRESENTS, that the sum of: _____

Dollars (\$ _____) set out in the accompanying Estimate Statement No. _____

Final, the receipt of which is hereby acknowledged, is accepted as full and complete payment for all work done, materials furnished, and damages or claims arising under the City of Holly Hill Contract entitled _____.

WITNESSES:

Contractor

Title: _____

(SEAL)

Taken, sworn, and subscribed to before me this _____ day of _____, 20____.

Notary Public Signature

Notary Public (Print or Type)

(SEAL)

My commission Expires: _____

END OF SECTION

SECTION 00800 SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (NSPE/ACEC Document No. C-700, 2018 edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

SC-1.01A.42 Delete the definition of *Substantial Completion* and insert the following in its place:

42. *Substantial Completion* - The Work (or a specified part thereof) has progressed to the point where, in the opinion of the Engineer as evidenced by Engineer's definitive Certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents and that all conditions precedent to Substantial Completion have been met in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Add the following definitions at the end of Article 1 - definitions of the Standard General Conditions of the Construction Contract:

SC-1.01.A.51 Compensable Delay - Any delay beyond the control and without the fault or negligence of the Contractor resulting from Owner-caused changes in the Work, differing site conditions, suspensions of the Work, or termination for convenience by the Owner.

SC-1.01.A.52 Correction Period - The time during which the Contractor must correct defective Work or remove defective Work from the site and replace it with non-defective Work, all at no cost to the Owner, pursuant to paragraph 14.03 of the General Conditions, as supplemented.

SC-1.01A.53 Final Completion - The date upon which final payment is due to be paid by Owner to Contractor.

SC-1.01A.54 Excusable Delay - Any delay beyond the control and without the fault or negligence of the Contractor, the Owner, or any other Contractor caused by events or circumstances such as, but not limited to, acts of God or of the public enemy, acts of interveners, acts of the government, fires, floods, epidemics, quarantine restrictions, freight embargoes, and hurricanes, tornadoes, or new sink holes. Labor disputes and above average rainfall shall give rise only to Inexcusable Delays.

SC-1.01A.55 Float or Slack Time - The time available in the progress schedule during which an unexpected activity can be completed without delaying the Substantial Completion of the Work.

- SC-1.01A.56 Initiation of Operation - The date when the Owner actually begins to use the entire Work for the purposes for which it was planned, designed and built, thus commences the Correction Period. The Owner shall not be deemed to have accepted the Work until Initiation of Operation.
- SC-1.01A.57 Modification - (a) A written amendment of the Contract Documents signed by both parties, (b) a Change Order, or (c) a Field Order. A modification may be issued after the Effective Date of the Agreement.
- SC-1.01A.58 Inexcusable Delay - Any delay caused either (i) by events or circumstances within the control of the Contractor, such as inadequate crewing, slow submittals, etc., which might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the Contractor, (ii) by weather conditions (other than hurricanes and tornadoes) or (iii) labor disputes.
- SC-1.01A.59 Non-Prejudicial Delay - Any delay impacting a portion of the Work within the available total Float or Slack Time, as that term is used in Section 01 31 00: Progress Schedules, and not necessarily preventing completion of the Work within the Contract Time.
- SC-1.01A.60 Prejudicial Delay - Any Excusable or Compensable Delay impacting the Work and exceeding the total Float Time available in the progress schedule, thus preventing completion of the Work within the Contract Time unless the Work is accelerated.
- SC-1.01A.61 Preoperational Testing (Check-Out-Testing) - All field inspections, installation checks, water tests, performance tests, and necessary corrections required of the Contractor as a condition or conditions to achieving Substantial Completion to demonstrate to the Owner and Engineer that individual components of the Work have been properly constructed and operate in accordance with the Contract Documents for their intended purposes.
- SC-1.01A.62 Start-Up Testing (Demonstration Testing) - A predefined trial period required as a condition to Initiation of Operation during which Contractor is to operate the entire Work (or any part thereof agreed to by the Owner) under actual and simulated operating conditions for the purpose (i) of making such minor adjustments and changes to the Work as may be necessary for the Work to comply with the Contract Documents and (ii) of complying with the final test requirements in the Contract Documents."
- SC-2.02 Modify paragraph 2.02A of the General Conditions:
- A. Owner shall furnish Contractor one portable document format (PDF) copy of contract.
- SC-3.03 Add the following immediately after paragraph 3.03 A.3. of the Standard General Conditions:

- A. The Contractor shall not take advantage of any apparent error or omissions which may be found in the Drawings or Specifications, and the Engineer shall be entitled to make such corrections therein and interpretations thereof as may be deemed necessary for the fulfillment of their intent. The Contractor shall be responsible for all errors in construction which could have been avoided by such examination and notification and shall correct, at its own expense, all Work improperly constructed through failure to notify the Engineer and request specific instructions.

SC-3.03 Add the following immediately after paragraph 3.03B:

C. Order of Precedence of Contract Documents:

1. In resolving differences resulting from conflicts, errors or discrepancies in any of the following Contract Documents, the order of precedence shall be as follows:
 - a. Permits
 - b. Change Orders
 - c. Contract Agreement
 - d. Specification
 - e. Drawings
2. Within the Specifications, the order of precedence is as follows:
 - a. Addenda
 - b. Notice to Bidders
 - c. Instructions to Bidders
 - d. Supplementary General Conditions
 - e. General Conditions
 - f. Division 1, General Requirements
 - g. Technical Specifications
 - h. Referenced Standard Specifications
3. With reference to the Drawings, the order of precedence is as follows:
 - a. Figures govern over scaled dimensions
 - b. Detail drawings govern over general drawings
 - c. Change order drawings govern over contract drawings
 - d. Contract drawings govern over standard or shop drawings

- SC-4.01 Delete paragraph 4.01 of the General Conditions in its entirety and insert the following in its place.
- A. A "Notice to Proceed" may be given to the Contractor at any time after the Effective date of the Agreement. The Contract Time will commence to run on the day indicated in the Notice to Proceed. In no event will the Contract Time commence to run later than the sixtieth (60th) day after the Effective Date of the Agreement.
- SC-5.04 Change the first sentence in the paragraph to "Then Contractor shall, within three (3) days after becoming aware thereof..."
- SC-5.06 Add a new paragraph immediately after paragraph 5.06 K of the Standard General Conditions which is to read as following:
- L. No claim of the Contractor under paragraphs 5.03, 5.05 and 5.06 shall be allowed unless, (1) the Contractor has given the notice required in sub-paragraph 5.06E, and (2) within thirty (30) days (but before final payment) after the Contractor has given written notice, the Contractor submits to the Owner a detailed claim setting forth the Contractor's right to an increase in the Contract Price or extension of the Contract Time as provided in Articles 11 and 13 of the Standard General Conditions.
- SC-6.01 Add a new paragraph immediately after paragraph 6.01 C of the Standard General Conditions which is to read as follows:
1. The following requirements shall be met by all surety companies furnishing bid, performance, payment or other type of Bonds:
- a. The Surety shall be rated as "A" or better as to General Policyholders Rating and Class X or better as to Financial Category by Best's Key Rating Guide, published by Alfred M. Best Company, Inc., 75 Fulton Street, New York, New York, 10038.
- All Surety Companies are subject to approval and may be rejected by the Owner without cause.
2. Limitations: Bonding limits or bonding capacity refers to the limit or amount of Bond acceptable on any one (1) risk.
- a. The bonding limit of the Surety shall not exceed ten percent

(10%) of the policyholder surplus (capital and surplus) as listed by the aforementioned Best's Key Rating Guide, on any one risk (penalty or amount of any one bond).

3. Requirements:

- a. Policyholders surplus is required to be five (5) times the amount of any one bond.
- b. The Agent countersigning the bond shall be resident in the County where the Project is located and/or other counties that are acceptable to the Owner.

SC-6.01 Add a new paragraph immediately after paragraph 6.01 H of the Standard General Conditions which read as follows:

- I. Contractor shall pay Owner all losses, damages, expenses, costs, and attorney's fees, including but not limited to any appellate proceedings, which the Owner sustains because of default by the Contractor under the contract.

SC-7.02 Add the following sub-paragraphs immediately after paragraph 7.02 B of the Standard General Conditions which are to read as follow:

- C. The Owner reserves the right to review and approve the resident superintendent.

SC-7.03 Add the following sub-paragraphs immediately after paragraph 7.03C of the Standard General Conditions which are to read as follow:

- D. Maintenance work may be performed during hours other than regular working hours. Regular working hours are defined as daylight hours between one-half hour after sunrise to one-half hour before sunset. Requests to Work during other regular working hours must be submitted to the Owner at least seventy-two (72) hours in advance of the period proposed for such irregular working hours and shall set forth the proposed schedule for such hours to give the Owner ample time to arrange for its personnel to be at the site of the Work.
- E. The Owner will pay for charges of Engineer and construction observation performed during regular working hours. The Contractor shall pay for additional engineering and construction observations charges required during irregular hours which may be authorized under the provisions of paragraph SC-7.03D. The rate paid to the Owner by the Contractor for additional engineering and construction observation changes shall be in accordance with the existing Contract between the Owner and Engineer.

- F. The Contractor shall also pay for the costs of additional engineering charges and construction observation required during the correction of defective Work. Such additional costs incurred during irregular working hours and during the correction of defective Work, shall be a subsidiary obligation of the Contractor and no extra payment shall be made by the Owner on account of such Work.

SC-7.07E. Revise 2nd to last sentence of paragraph to “If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto within 45 days of identification submission), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation.”

SC-7.13 Add the following paragraphs immediately following paragraph 7.13J.

- K. The Engineer is not responsible for the safety of any person on the jobsite other than the Engineer’s own employees. The Engineer has no authority to exercise any control over any construction Contractor or other entity or their employees in connection with their work or any health or safety precautions. The Owner agrees that the Contractor is solely responsible for jobsite safety and warrants that this intent shall be made evident in the Owner’s agreement with the Contractor. The Owner agrees that the Engineer shall be entitled to indemnification from the Contractor for any loss incurred by the Engineer arising out of any claim brought by any person or personal injuries sustained on the jobsite and warrants that this intent shall be made evident in the Owner’s agreement with the Contractor. The Engineer shall be made an additional insured under the Contractor’s general liability insurance policy for personal injuries to any person sustained on the jobsite.

SC-8.02 Add the following paragraphs immediately following paragraph 8.02B:

- C. The Contractor shall cooperate with all other Contractors who may be performing Work on behalf of the Owner in the vicinity of the Work to be done under this contract, and he shall conduct his operation as to interfere to the least possible extent with the Work of such Contractor.
- D. If the Work is delayed because of any acts of omissions of any other Contractor, the Contractor shall have no claim against the Owner on that account.

SC-15.01D This section is hereby deleted. The requirements of Florida Statute 218.735 of the Florida Prompt Payment Act shall apply.

SC-15.08 Add the following new sub-paragraph immediately after sub-paragraph 15.08A.4:

5. When deemed necessary by Owner, Contractor shall furnish and install at no cost to Owner, such temporary equipment and material necessary to maintain functionality of the Work while defective Work is being corrected or replaced.

SC-15.08 Add the following new paragraphs immediately after paragraph 15.08F:

- G. Subject to adjustments as described in sub-paragraph 15.08H, the period during which the Contractor must correct defective Work or remove it from the site and replace it with non-defective Work, all at no cost to the Owner (the "Correction Period"), shall be no more than one (1) year. If the date of Substantial Completion is not the same date as Initiation of Operation, such Correction Period shall commence upon Initiation of Operation, not upon the date of Substantial Completion. In such cases, the time between Substantial Completion and Initiation of Operation shall not exceed one hundred (100) days.
- H. No later than thirty (30) days before Initiation of Operation the Owner shall notify the Contractor in writing of the date upon which Initiation of Operation is expected to occur, and the Contractor shall ensure that the Work is ready in its entirety by such date for use by the Owner as contemplated in the Contract Documents.
- I. From the date of Substantial Completion until Initiation of Operation, the Contractor shall bear all risks of injury, loss, or damage to any part of the Work arising from the elements or from any other cause. The Contractor shall rebuild, repair, restore, and make good at no cost to the Owner, all injuries, losses, or damage to any portion of the Work occasioned by any cause and shall, at no expense to the Owner, provide suitable drainage and erect such temporary structures and take all other actions as are necessary for the protection of the Work. Suspension of the Work or the granting of an extension of the Contract Time for any cause shall not relieve the Contractor of its responsibility for the Work as herein specified. The Contractor's responsibilities under this paragraph 15.08 are in addition to, not in lieu of, all other obligations imposed by these Contract Documents.

SC-17 Delete Article 17 and all other references to "Dispute Resolution Agreement" in the Standard General Conditions. Disputes between Owner and Contractor shall be arbitrated only if and to the extent agreed to by the parties at the time each dispute arises. The Contractor shall carry on the Work and maintain the progress schedule during any dispute, regardless of how resolved, unless otherwise mutually agreed in writing. Venue for any litigation, at law or equity or arbitration, shall lie exclusively in the place of the County of the Owner's location. This Contract, or any provision hereof, shall be construed and interpreted, and any litigation arising there from, shall be governed by the laws of the State of Florida.

SECTION 00 80 00-A

**CONTRACTORS STANDARD INSURANCE REQUIREMENTS
AND INDEMNIFICATION CLAUSE**

I. INSURANCE

- A. Prior to commencing work, the Contractor shall provide at his own cost and expense insurance to the City of HOLLY HILL as required below. The insurance companies must be licensed in the State of Florida and be rated by A.M. Best as A: Class X or better. The required insurance shall be evidenced by certificates and/or policies as determined by the City. All policies and certificates of insurance shall be approved by the City prior to inception of any work.
- B. It is required that each Certificate of Insurance and/or policy must give 30 days prior written notice of cancellation, non-renewal or adverse change to the City of HOLLY HILL Finance Department by registered mail, return receipt requested. All such notices shall name the Contractor and identify the contract number.
- C. The "City of HOLLY HILL," wherever used, shall be defined to include the City itself, elected officials, officers, employees, volunteers, representatives, agents and any affiliates.
- D. The "Contractor," wherever used, shall be defined to include the Contractor, any subsidiaries or affiliates, officers, employees, volunteers, representatives, agents, contractors and subcontractors.
- E. If at any time any of the required policies shall be or shall become unsatisfactory to the City as to form or substance, or if the insurance company becomes unsatisfactory to the City, the Contractor shall, upon written notice to that effect from the City, promptly obtain a new policy, submit the policy to the City for approval, and submit the Certificate of Insurance, as previously required.

If at any time the Contractor shall fail to furnish and/or maintain the required insurance, this contract may be declared suspended, discontinued or terminated, at the discretion of the City. Failure of the Contractor to take out and/or maintain any of the required insurances shall not relieve the Contractor from any liability under the contract, nor shall the insurance requirements be construed to conflict with or otherwise limit the obligations of the Contractor concerning indemnification.

- F. The Contractor is required to provide new Certificates of Insurance to the City at least 20 days prior to the coverage renewal dates. If any of the insurance requirements are not complied with at their renewal dates, the City may at their option, (1) withhold payments to the Contractor until those requirements have been met or, (2) pay the renewal premium and withhold such payments from any monies due the Contractor.
- G. In the event of any claims having been filed due to any operation under this contract that are in excess of the insured amounts, the excess amount of such claim, or any portion thereof, may be withheld from payments due the Contractor until such time as the Contractor shall furnish such additional security covering such claims as may be determined by the City of HOLLY HILL

- H. The Contractor shall provide the following insurance on forms no more restrictive than the latest edition of those filed by the Insurance Services Office, and name the "City of HOLLY HILL" (as defined in "C" above) as an Insured to the extent of the City's interests.

II. LIABILITY INSURANCE

- A. WORKERS' COMPENSATION - STATUTORY - in compliance with the Workers' Compensation law of the State of Florida including employers liability coverage of at least \$100,000. If any operations are to be undertaken on or about navigable waters, coverage must be included for the U.S. Longshoremen and Harbor Workers Acts and Jones Act.

- B. COMMERCIAL GENERAL LIABILITY - with minimum limits of:

\$2,000,000	General Aggregate
\$1,000,000	Products - Completed Operations Aggregate
\$1,000,000	Personal and Advertisement Injury
\$1,000,000	Each Occurrence
\$ 100,000	Fire Damage

- C. BUSINESS AUTOMOBILE LIABILITY - with minimum limits of \$1,000,000 per occurrence combined single limit. This insurance shall include for bodily injury and property damages the following coverage's:

- (1) Owned Automobiles
- (2) Hired Automobiles
- (3) Non-owned Automobiles
- (4) Employee Non-ownership

NOTE! The required limits of liability for the above policies may include umbrella insurance with the umbrella policy making up the difference between the policy limits of the underlying policies and the total amount of coverage required. Such Umbrella Liability insurance shall be a "follow form" and be at least as broad as the underlying policies.

III. PROPERTY INSURANCE

When this contract includes construction of and/or additions to above-ground buildings or structures, Builder's Risk and/or Installation Floater policies must be provided as follows:

- A. BUILDER'S RISK - "All risk" form in the amount of 100% of the completed value of such addition, building or structure to include personal property of others in the care, custody or control of the Contractor, and shall include a flat-premium endorsement.

- (1) Maximum Deductible - \$5,000 each claim

- (2) Certified Copy of the policy must be provided to the City prior to the commencement of work.
 - (3) Waiver of Occupancy Clause or Warranty - to provide that the Builder's Risk coverage will continue to apply until final acceptance by the City of the building or addition, regardless of any prior occupancy.
 - (4) Flood Insurance must be provided when buildings or structures are located within an identified special flood hazard area. The Flood Insurance must protect the interest of the City and be in the amount of the total insurable value of such building or structure, or the maximum amount of flood insurance coverage available under the National Flood program, whichever is the lesser.
 - (5) For additions or repairs of existing buildings or structures, the "Builder's Risk Completed Form" covering the Contractor's interest in improvements, repairs, additions, or alterations to completed buildings, shall be included.
 - (6) Bridges, Viaducts or similar structures - the "Bridge Builders Risk Form" - "All risk" contract with the flat-premium endorsement should be utilized.
- B. **INSTALLATION FLOATER** - when the contract is for the installation of machinery and/or equipment into an existing structure, but does not contemplate construction of or addition to the structure itself.
- (1) "All Risk" coverage to include transit and installation.
 - (2) Amount of Insurance - 100% of installed replacement cost value
 - (3) Maximum Deductible - \$5,000 each claim.
 - (4) Cessation of Insurance - Coverage is to continue in force until final acceptance by the City.
 - (5) Certified Copy of the policy must be provided to the City prior to commencement of work.
 - (6) Flood Insurance - must be provided when machinery or equipment are located within an identified special flood hazard area. The Flood Insurance must protect the interest of the city and be in the amount of the total insurable value of such machinery or equipment.

IV. **CERTIFICATE OF INSURANCE CLAUSES**

All policies and Certificates of Insurance of the Contractor shall contain the following clauses and agreements:

- A. Insurers shall have no right of recovery or subrogation against the City of HOLLY HILL (as defined in "C" above), it being the intention of the parties that the insurance policies so effected shall protect both parties and be primary coverage for any and all losses covered by the above described insurance.

- B. The clause "other insurance" in a policy in which the City of HOLLY HILL is named as an Insured shall not apply to the City of HOLLY HILL.
- C. The insurance companies issuing the policies shall have no recourse against the City of HOLLY HILL (as defined in "C" above) for payment of any premiums or for assessments under any policy for insurance.
- D. The contractor's insurer shall be requested to include a breach of warranty clause to prevent nullification of insurance because the Contractor breaches a condition of the policy.
- E. Any and all deductibles in the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of the Contractor.
- F. Any loss payable under the Property Insurance, if any, is to be adjusted with and made payable to the City of HOLLY HILL, as their interest may appear.

V. CITY INDEMNIFICATION

The following Indemnification Agreement shall be a provision of this contract and also shall be endorsed onto or attached to the insurance policy and Certificate of Insurance:

"The Contractor agrees to protect, defend and pay on behalf of, and hold the City of HOLLY HILL and its elected officials, officers, employees, volunteers, representatives, agents and affiliates free and harmless from and against all claims for personal or bodily injury or death, or property damage or destruction of tangible property including loss of use thereof, losses, penalties, damages, settlements, costs, charges, professional fees or other expenses of every kind and character in connection with and arising directly or indirectly out of this agreement and/or performance thereof, unless such claims are a result of the City of HOLLY HILL's sole negligence. This indemnification clause includes claims made by the employees and subcontractors of the Contractor against the Owner and the Contractor hereby waives its entitlement, if any, to immunity under Section 440.11, Florida Statutes. Nothing contained herein shall be construed as a waiver of any immunity from or a limitation of liability the City may have under the doctrine of sovereign immunity or Chapter 768.28, Fla. Stat. This indemnification provision shall survive the completion of the project and shall be in full force and effect beyond the completion of the project or the termination of this contract.

VI. ENGINEER INDEMNIFICATION

"The Contractor agrees to protect, defend and pay on behalf of, and hold the ENGINEER and its officers, employees, and affiliates free and harmless from and against all claims for personal or bodily injury or death, or property damage or destruction of tangible property including loss of use thereof, losses, penalties, damages, settlements, costs, charges, professional fees or other expenses of every kind and character in connection with and arising directly or indirectly out of this agreement and/or performance thereof, unless such claims are a result of the ENGINEER'S sole negligence. This indemnification clause includes claims made by the employees and subcontractors of the Contractor against the ENGINEER. This indemnification provision shall survive the completion of the project and shall be in full force and effect beyond the completion of the project or the termination of this contract.

The Contractor shall be responsible for such requirements through the date of final acceptance of the project by the City. With regard to the Contractor's indemnification obligation for products

and completed operations, the Contractor shall be responsible for a minimum period of at least one year subsequent to the City's acceptance of the product or completed operation."

- VII.** The following Insurance Requirement Checklist shall be adhered to in its entirety. The coverage limits and language as indicated on the following checklist shall be reflected on the Contractor's Certificate of Insurance.
- VIII.** A Waiver of Subrogation shall be provided to the City.
- IX.** The Contractor' insurance carrier shall submit a letter showing authorization that the company is registered by the State of Florida Department of Insurance

Revised September 2005

**CITY OF HOLLY HILL, FLORIDA
INSURANCE REQUIREMENTS CHECKLIST
CITY OF HOLLY HILL, VOLUSIA COUNTY, FLORIDA**

Items marked "X" must be provided

<u> X </u>	<u>General Liability</u>	Minimum Limits Required	
	<u> X </u> Commercial General Liability	\$ <u>2,000,000</u>	General Aggregate
	<u> X </u> Occurrence Form	\$ <u>1,000,000</u>	Product/Completed Operations Agg.
	_____	\$ <u>1,000,000</u>	Personal & Advertising Injury
	_____	\$ <u>1,000,000</u>	Each Occurrence
	_____	\$ <u>100,000</u>	Fire Damage Pump Stations
<u> X </u>	<u>Automobile Liability</u>		
	Owned, Hired & Non-Owned	\$ <u>1,000,000</u>	Combined Single Limit per Occurrence
<u> X </u>	<u>Worker's Compensation and Employer's Liability</u>	Statutory	
		\$ <u>100,000</u>	Each Accident
		\$ <u>500,000</u>	Disease - Policy Limit
		\$ <u>100,000</u>	Disease - Each Employee
_____	<u>Professional Liability - Errors & Omissions</u> (*To be completed by Bidder)		
	* Deductible: \$ _____	\$ _____	Aggregate
	* Claims Made (Y/N): _____	\$ _____	Each Claim
	*Occurrence (Y/N): _____		
	*Defense included in Limits (Y/N): _____		
<u> X </u>	<u>Builder's Risk/Installation Floater</u> (*To be completed by Bidder)		
	* Flood included \$ _____ Limit	\$ _____	100% of Completed or Installed Value, All-Risk Form
	* Transportation included \$ _____ Limit		
	* Storage included \$ _____ Limit		
	City must be a named insured. Copy of policy will be required.		
_____	<u>Other</u>		
	_____	\$ _____	
	_____	\$ _____	
<u> X </u>	The Certificate of Insurance must show "The City of HOLLY HILL, elected officials and employees" and the adjacent property owners as an additional insured.		
<u> X </u>	Certificates must give to the City of HOLLY HILL 30 days' prior written notice of cancellation, non-renewal, or adverse change.		
<u> X </u>	Certificates must identify bid number and bid title.		
<u> X </u>	A Wavier of Subrogation shall be provided to the City		

Statement of Bidder:

We understand the requirements requested and agree to comply fully.

Bidder - Authorized Signature

A complete copy of this form with original signature must accompany bid.

SECTION 00 84 00
CONTRACTOR REQUEST FOR INFORMATION (RFI)

PROJECT NAME: **LIFT STATION #9 REPLACEMENT**

OWNER: _____

ENGINEER: _____ PROJECT NO. _____

CONTRACTOR: _____ PROJECT NO. _____

RFI NO. _____ SPEC. SECT. _____ DRAWING NO. _____

RFI SHORT TITLE: _____

QUESTION/ISSUE: _____

BY: _____ DATE: _____

REPLY: _____

BY: _____ DATE: _____

CC:

☐

CONTRACTOR

☐

FIELD (INSPECTOR)

☐

OWNER

☐

ARCHITECT

☐

OTHER: _____

END SECTION

**SECTION 00 84 10
NOTICE OF AWARD FORM**

Date: _____

Contractor: _____

Project:

Date of Bid Opening: _____

You are notified that your bid dated _____, 20____ for the above Contract has been considered and the OWNER, expects to award you a contract for:

_____.

(Indicated total Work, Alternates or Sections of Work Awarded)

The Contract Price of your contract is _____
Dollars (\$_____).

Five (5) copies of each of the following proposed Contract Documents (except Project Manual and Drawings) accompany this Notice of Award:

- ◆ Agreement Between Owner and Contractor
- ◆ Payment and Performance Bond
- ◆ Public Construction Bond
- ◆ Insurance Requirements
- ◆ Affidavit Regarding Workman's Compensation
- ◆ Certificate of Insurance for Workman's Compensation

You must comply with the following conditions to the awarded contract within ten (10) days of the date of the Notice of Award, which is by _____, 20__.

1. You must deliver to the OWNER five (5) fully executed counterparts of the Agreement.
2. You must deliver with the executed Agreement five (5) completed original documents with original signatures on the Payment and Material Payment Bond and Public Construction Bond in the form specified in the Bidding Documents.
3. You must provide in writing the correct name and address of the surety which is providing the Payment and Material Payment Bond and Public Construction Bonds and the correct name and address of the surety's resident agent for service of process in Florida.
4. You must deliver with the executed Agreement five (5) completed, with original signatures, Certificates and Endorsements of Insurance in the form specified in the Bidding Documents.

Failure to comply with these conditions within the time specified will entitle the OWNER to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid Security forfeited.

Within ten (10) days after you comply with these conditions, the OWNER will return to you two (2) fully signed counterparts of the agreement with the Contract Documents attached.

OWNER'S REPRESENTATIVE:

(Authorized Signature)

(Title)

Date: _____

END OF SECTION

SECTION 00 84 20
NOTICE TO PROCEED FORM

Date: _____

Contractor: _____

Notice to Proceed on Project:

You are notified that the Contract Time under the above contract will commence to run on _____, 20____. On that date you are to start performing the Work and your other obligations under the Contract Documents. Based on the Contract Time stated in the Agreement, we calculate that the dates of substantial Completion and Final Completion are _____, 20____, and _____, 20____, respectively.

Work at the site must be started by _____, 20__ as indicated in the Contract Documents.

Enclosed is one (1) set of Drawings and one (1) bound copy of the Project Manual containing:

- Instruction to Bidders
- Bid Form
- Bid Bond
- Executed Agreement
- Payment and Performance Bond
- Public Construction Bond
- Certificates of Insurance
- General Conditions
- Supplementary Conditions
- Notice of Award
- Specifications
- Addenda Numbers ____ through ____

OWNER'S REPRESENTATIVE:

(Name/Title)

(Date)

END OF SECTION

SECTION 00 84 30
CHANGE ORDER FORM

PROJECT:

CHANGE ORDER NO. _____

CONTRACTOR: _____

The following changes are hereby made to the Contract Documents:

CHANGE IN CONTRACT PRICE: Original Contract Price: \$ _____	CHANGE IN CONTRACT TIMES: Original Contract Times: Substantial Completion: _____ Final Completion:
Net changes from previous Change Orders No. _____ to No. _____. \$ _____	Changes in contract time from previous Change Orders No. _____ to No. _____. _____ Days
Contract Price prior to this Change Order: \$ _____	Contract Completion Date prior to this Change Order: Final Completion:
Net Increase (decrease) of this Change Order: \$ _____	Changes in contract time requested this Change Order No. ____ _____ Days
Contract Price with all approved Change Orders: \$ _____	Contract Times with all approved Change Orders: Final Completion:

CHANGES ORDERED:

- I. GENERAL – This change order is necessary to cover changes in the work to be performed under this Contract. The General Conditions, Supplementary Conditions, Specifications and all parts of the Project Manual listed in Article 1, Definitions, of the General Conditions apply to and govern all work under this change order.

The change in price and/or delivery date described, is considered to be fair and reasonable and has been mutually agreed upon in full agreement and final settlement of all claims arising out of the modification including all claims for delays and disruptions resulting from, caused by, or incident to such modifications and change orders.

II. REQUIRED CHANGES:

III. JUSTIFICATION:

IV. PAYMENT:

Acknowledgments:

The aforementioned change, and work affected thereby, is subject to all provisions of the original contract not specifically changed by this Change Order;

It is expressly understood and agreed that the approval of the Change Order shall have no effect on the original contract other than matters expressly provided herein;

The prices quoted are fair and reasonable and in proper ratio to the cost of the original work contracted for under competitive bidding; and,

The change in price and/or delivery date described is considered to be fair and reasonable and has been mutually agreed upon in full agreement and final settlement of all claims arising out of this modification including all claims for delays and disruptions resulting from, caused by, or incident to such modifications and change orders.

RECOMMENDED BY:

Mead & Hunt
(Engineer)

By: _____
Name Typed (Date)

(Authorized Signature)

ACCEPTED BY:

(Contractor)

Name Typed (Date)

(Authorized Signature)

APPROVED BY:

Owner

By: _____
Name Typed (Date)

(Authorized Signature)

END OF SECTION

SECTION 00 84 40

APPLICATION AND CERTIFICATE FOR PAYMENT FORM

Application No. _____ Progress _____ Final _____

Engineer's Project No.: _____

Project: _____

Contractor: _____ Contract Date: _____

Contract for : _____

Application Date: _____ For Period Ending _____

Change Order Summary			
Change Orders approved in previous months by OWNER		ADDITIONS	DEDUCTIONS
TOTAL		\$ 0.00	\$ 0.00
Approved this month			
Number	Date Approved		
TOTALS		\$ 0.00	\$ 0.00
Net Change by Change Orders			\$ 0.00

1.	ORIGINAL CONTRACT SUM	\$ 0.00
2.	Net Change by Change Order	\$ 0.00
3.	CONTRACT SUM TO DATE (Line 1 and 2)	\$ 0.00
4.	TOTAL COMPLETED AND STORED TO DATE	\$
5.	RETAINAGE: (Column I & N, Forms 00845 and 00846)	
	a. ____% of Completed Work	\$
	b. ____% of Stored Material	\$
	Total Retainage (Line 5a and 5b)	\$ 0.00
6.	TOTAL EARNED LESS RETAINAGE (Line 4 less Line 5 Total)	\$ 0.00
7.	LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$ 0.00
8.	AMOUNT DUE THIS APPLICATION	\$ 0.00
9.	BALANCE TO FINISH, PLUS RETAINAGE (Line 3 less Line 6)	\$ 0.00

Contractor's Certification

The undersigned Contractor hereby swears under penalty of perjury that (1) all previous progress payments received from the Owner on account of Work performed under the contract referred to above have been applied by the undersigned to discharge in full all obligations of the undersigned incurred in connection with Work covered by prior Applications for Payment numbered 1 through ____ inclusive; and (2) all materials and equipment incorporated in said Project or otherwise listed in or covered by this Application for Payment are free and clear of all liens, claims, security interest and encumbrances; (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective as that term is defined in the Contract Documents.

Dated _____

(Contractor)

By: _____

(Name)

(Title)

COUNTY OF
STATE OF

Before me on this _____ day of _____, 20____, personally appeared _____, known to me, who being duly sworn, deposes and says that (s)he is the _____ of the Contractor above mentioned; that s(he) executed the above Application for Payment and statement on behalf of said Contractor; and that all of the statements contained therein are true, correct and complete.

(Notary Seal)

Notary Public

My commission Expires _____

Engineer's Recommendation

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Mead & Hunt

By: _____

(Authorized Signature)

Date: _____

Owner's Approval

By: _____

(Title)

Acct No. _____

Date: _____

END OF SECTION

00 84 40-3

SECTION 00 84 40
BID ITEM PAY REQUEST FORM

Application No.
Project:

Application Date:
Period Ending:
Contractor:

Owner:

[illegible]

Section 00 84 60

Stored Materials Summary

Owner:
Project:
Bid No.:
Contractor:

Date:

Received thru:
Installed thru:

[illegible]

Subtotal	
Sales Tax	
Total	

SECTION 00 84 80
CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNER'S Project No.: _____ ENGINEER's Project No.: _____

CONTRACTOR: _____

Contract Date: _____

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof.

To: _____
 Owner

And To: _____
 Contractor

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on:

 Date of Substantial Completion

Certificate of Substantial Completion
 Page 1 of 3

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item therein does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract documents. When this Certification applies to a specified part of the Work the items in the tentative list shall be completed or corrected by CONTRACTOR within _____ days of the above date of Substantial Completion.

The date of Substantial Completion is the date upon which all guarantees and warranties begin, except as follows:

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities and insurance shall be as follows:

RESPONSIBILITIES:

OWNER _____

CONTRACTOR _____

The following documents are attached to and made a part of this Certificate:

Certificate of Substantial Completion
Page 2 of 3

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR'S obligation to complete the Work in accordance with the Contract Documents.

Executed by ENGINEER on _____, 20__.

(Engineer)

By _____

The CONTRACTOR accepts this Certificate of Substantial Completion on _____, 20__.

(Contractor)

By _____

Certificate of Substantial Completion
Page 3 of 3

SECTION 00 84 90
CONTRACTOR'S FINAL RELEASE OF LIEN

Before me the undersigned authority in said County and State, appeared _____ who, being first duly sworn, deposes and says that he is _____ of _____

_____, a company and/or corporation authorized to do business under the laws of Florida, which is the Contractor on the Contract described as: **LIFT STATION #9 REPLACEMENT** dated the ____ day of _____, 20____, that the said deponent is duly authorized to make this affidavit by resolution of the Board of Directors of said company and/or corporation; that deponent knows of his own knowledge that said Contract has been complied with in every particular by said Contractor and that all parts of the work have been approved by the Owner's Engineers; that there are no bills remaining unpaid for labor, material, or otherwise, in connection with said Contract and work, and that there are no suits pending against the undersigned as Contractor or anyone in connection with the work done and materials furnished or otherwise under said Contract. Deponent further says that the final estimate which has been submitted to the owner simultaneously with the making of the affidavit constitutes all claims and demands against the Owner on account of said Contract or otherwise, and the acceptance of the sum specified in said final estimate will operate as full and final release and discharge of the Owner from any further claims, demands or compensation by Contractor under the above Contract. Deponent further agrees that all guarantees under this Contract shall be in full force from the date of this release as spelled out in the Contract Documents.

Sworn to and subscribed to before me this ____ day of _____, 20 ____.

Notary Public

My Commission Expires: _____

We, the _____ having heretofore executed a Performance Bond for the above-mentioned Contractor covered Project and Section as described above in the sum of _____ dollars (\$ _____), hereby agree that the Owner may make full payment of the final estimate, including the retained percentage, to said Contractor.

It is fully understood that the granting of the right to the Owner to make payment of the final estimate to said Contractor and/or his assigns, shall in no way release the surety company of its obligations under its bond, as set forth in the Specifications, Contract and Bond pertaining to the above Project.

IN WITNESS WHEREOF, the _____ has caused this instrument to be executed on its behalf by its _____ and/or its duly authorized attorney in fact, and its corporate seal to be hereunto affixed, all of this _____ day of _____, A.D., 20_____.

Surety Company

Attorney in Fact

(Power of Attorney must be attached if executed by Attorney in Fact)

STATE OF FLORIDA

COUNTY OF _____

Before me the undersigned authority, personally appeared to me well known as the person described in and who executed the foregoing instrument in the name of _____ and/or authority to execute the same on behalf of said _____, a corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal at _____ this _____ day of _____, 20_____.

Notary Public

My Commission Expires: _____

END OF SECTION

SECTION 01 00 00
PROJECT REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The Work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all Work included in this Contract. The summary of the Work is presented in Section 01 11 00: Summary of Work.
- B. Work Included:
1. The CONTRACTOR shall furnish all labor, superintendence, materials, plant power, light, heat, fuel, water, tools, appliances, equipment, supplies, and means of construction necessary for proper performance and completion of the Work. The CONTRACTOR shall obtain and pay for all necessary local building permits. The CONTRACTOR shall perform and complete the work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the ENGINEER, and in strict accordance with the Contract Documents. The CONTRACTOR shall clean up the Work and maintain it during and after construction, until accepted, and shall do all Work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the Work.
 2. The cost of incidental work described in these Project Requirements, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the Work and shall be included in the prices for the various Contract Items. No additional payment will be made therefore.
 3. The CONTRACTOR shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the ENGINEER, to perform in a satisfactory and acceptable manner all the Work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The CONTRACTOR shall be solely responsible for the adequacy of his workmanship, materials, and equipment, prior approval of the ENGINEER notwithstanding.

C. Public Utility Installations and Structures:

1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the OWNER, other governmental bodies, or privately owned by individuals, firms, or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water, or other public or private property which may be affected by the Work shall be deemed included hereunder.
2. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the CONTRACTOR to make his own investigations to inform himself fully of the character, condition, and extent of all such installations and structures as may be encountered and as may affect the construction operations.
3. The CONTRACTOR shall protect all public utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made to avoid any damage to these facilities. All required protective devices and construction shall be provided by the CONTRACTOR at his expense. All existing public utilities damaged by the CONTRACTOR shall be repaired by the CONTRACTOR, at his expense. No separate payment shall be made for such protection or repairs to public utility installations or structures.
4. Public utility installations or structures owned or controlled by the OWNER or other governmental body which are shown on the Drawings to be removed, relocated, replaced, or rebuilt by the CONTRACTOR shall be considered as a part of the general cost of doing the Work and shall be included in the prices bid for the various Contract Items; therefore, no separate payment shall be made.
5. Where public utility installations of structures owned or controlled by the OWNER or other governmental body are encountered during the course of the Work, and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the ENGINEER, removal, relocation, replacement, or rebuilding is necessary to complete the Work under this Contract, such Work shall be accomplished by the utility having jurisdiction, or such Work may be ordered, in writing by the ENGINEER, for the CONTRACTOR to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously, and the CONTRACTOR shall give full cooperation to permit the utility to complete the removal, relocation, replacement, or rebuilding as required. If such work is accomplished by the

CONTRACTOR, it will be paid for as extra work as provided in the Agreement.

6. The CONTRACTOR shall, at all times, in performance of the Work, employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage, or destruction of public utility installations and structures; and shall, at all times in the performance of the Work, avoid unnecessary interference with, or interruption of, public utility services, and shall cooperate fully with the owners thereof to that end.
7. The CONTRACTOR shall give written notice to OWNER and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least 48-hours in advance of breaking ground in any area or on any unit of the Work.
8. The maintenance, repair, removal, relocation, or rebuilding of public utility installations and structures, when accomplished by the CONTRACTOR as herein provided, shall be done by methods approved by the owners of such utilities.

1.02 DRAWINGS AND PROJECT MANUAL

- A. Drawings: When obtaining data and information from the Drawings, figures shall be used in preference to scaled dimensions, and large-scale drawings in preference to small-scale drawings.
- B. Supplementary Drawings:
 1. When, in the opinion of the ENGINEER, it becomes necessary to explain more fully the Work to be done or to illustrate the Work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the ENGINEER, and the CONTRACTOR will be furnished one (1) complete set of reproducible Mylar sepias [24 inches by 36 inches (24" x 36")] and one (1) reproducible copy of the Project Manual.
 2. The Supplementary Drawings shall be binding upon the CONTRACTOR with the same force as the Contract Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of Work, credit to the OWNER or compensation therefore to the CONTRACTOR shall be subject to the terms of the Agreement.

C. CONTRACTOR to Check Drawings and Data:

1. The CONTRACTOR shall verify all dimensions, quantities, and details shown on the Drawings, Supplementary Drawings, schedules, Specifications, or other data received from the ENGINEER, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the CONTRACTOR of full responsibility for unsatisfactory work, faulty construction, or improper operation resulting there from, nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the ENGINEER, should such errors or omissions be discovered.
2. All schedules are given for the convenience of the ENGINEER and the CONTRACTOR and are not guaranteed to be complete. The CONTRACTOR shall assume all responsibility or the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract.

D. Specifications: The Technical Specifications consist of three (3) parts: General, Products, and Execution. The General part of a Specification contains General Requirements which govern the Work. The Products and Execution parts modify and supplement the General Requirements by detailed requirements for the Work and shall always govern whenever there appears to be a conflict.

E. Intent:

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the CONTRACTOR as though it were specifically delineated or described.
2. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, the interpretation of these Specifications shall be made upon that basis.

1.03 MATERIALS AND EQUIPMENT

A. Manufacturer:

1. All transactions with the manufacturers or subcontractors shall be through the CONTRACTOR, unless the CONTRACTOR shall request and at the ENGINEER's option, that the manufacturer or subcontractor deal directly with the ENGINEER. Any such transactions shall not in any way release the CONTRACTOR from his full responsibility under this Contract.
2. Any two (2) or more pieces of material or equipment of the same kind, type, or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery:

1. The CONTRACTOR shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the Work so as to complete the Work within the allotted time.
2. The CONTRACTOR shall also coordinate deliveries in order to avoid delay in, or impediment of, the progress of the work of any related CONTRACTOR.

C. Tools and Accessories:

1. The CONTRACTOR shall, unless otherwise stated in the Contract Documents, furnish with each type, kind, or size of equipment, one (1) complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled, and equipped with good grade cylinder locks and duplicate keys.
2. Spare parts shall be furnished as specified herein and as recommended by the manufacturer necessary for the operation of the equipment, not including materials required for routine maintenance.
3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place, and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight, and principal rate data.

D. Service of Manufacturer's Engineer:

1. The Contract Prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the CONTRACTOR, when required, to install, adjust, test, and place in operation, the equipment in conformity with the Contract Documents.
2. After the equipment is placed in permanent operation by the OWNER, such engineer or superintendent shall make all adjustments and tests required by the ENGINEER to prove that such equipment is in proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the OWNER in the proper operation and maintenance of such equipment.

1.04 INSPECTION AND TESTING

A. General:

1. For tests specified to be made by the CONTRACTOR, the testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five (5) copies of the reports shall be submitted, and authoritative certification thereof must be furnished to the ENGINEER as a prerequisite for the acceptance of any material or equipment.
2. If, in the making of any test of any material or equipment, it is ascertained by the ENGINEER that the material or equipment does not comply with the Contract Documents, the CONTRACTOR will be notified thereof, and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the Work and replace it with acceptable material, without cost to the OWNER.
3. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with the recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.
4. The CONTRACTOR shall be fully responsible for the proper operation of equipment during testing and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the OWNER formally takes over the operation thereof.

B. Costs:

1. All inspection and testing of materials furnished under this Contract will be provided by the CONTRACTOR, unless otherwise expressly specified.

2. The cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents shall be borne by the CONTRACTOR, and such costs shall be deemed to be included in the Contract Price.
3. Materials and equipment submitted by the CONTRACTOR as the equivalent to those specifically named in the Contract may be tested by the OWNER for compliance. The CONTRACTOR shall reimburse the OWNER for the expenditures incurred in making such tests of materials and equipment which are rejected for non-compliance.

C. Certificate of Manufacture:

1. CONTRACTOR shall furnish to ENGINEER authoritative evidence in the form of a certificate of manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents.
2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

D. Shop Tests:

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents.
2. Five (5) copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company and/or independent laboratory, shall be submitted to the ENGINEER for approval.
3. The cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the CONTRACTOR.

E. Start-up Tests:

1. As soon as conditions permit, the CONTRACTOR shall furnish all labor, materials, and instruments and shall make start-up tests of equipment.
2. If the start-up tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the CONTRACTOR shall, prior to demonstration tests, make all changes,

adjustments, and replacements required. The furnishing CONTRACTOR shall assist in the start-up tests as applicable.

F. Demonstration Tests:

1. Prior to CONTRACTOR's request for a Substantial Completion inspection, all equipment and piping installed under this Contract shall be subjected to demonstration tests as specified or required to prove compliance with the Contract Documents.
2. The CONTRACTOR shall furnish labor, fuel, energy, water, and all other materials, equipment, and instruments necessary for all demonstration tests, at no additional cost to the OWNER. CONTRACTOR shall assist in the demonstration tests as applicable.

1.05 LINES AND GRADES

A. Grade:

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings, or as given by the ENGINEER. The full responsibility for keeping alignment and grade shall rest upon the CONTRACTOR.
2. The vertical bench marks provided is USGS "Public Records" monumentation and the horizontal control is the monumentation on plats contained in the "Public Records of Volusia County."

B. Surveys:

1. The CONTRACTOR shall furnish and maintain, at his own expense, stakes, and other such materials.
2. The CONTRACTOR shall check such reference marks by such means as he may deem necessary and, before using them, shall call the ENGINEER's attention to any inaccuracies.
3. The CONTRACTOR shall, at his own expense, establish all working or construction lines and grades as required from the reference marks set by the ENGINEER, and shall be solely responsible for the accuracy thereof. He shall, however, be subject to the check and review by the ENGINEER.

C. Safeguarding Marks:

1. The CONTRACTOR shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost

of re-establishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes, and marks.

2. The CONTRACTOR shall safeguard all existing and known property corners, monuments, and marks adjacent to but not related to the Work and shall bear the cost of re-establishing them if disturbed or destroyed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 – GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. This Contract is for the construction of the:

LIFT STATION #9 REPLACEMENT

The work consists of furnishing all labor, equipment, and materials for the construction of the facilities consisting of, but not limited to, the following:

The replacement includes the conversion of the can lift station into a submersible station. Work includes bypass pumping, demolition of (2) existing pumps, piping, and valves to abandon pump can. Installation of two (2) new submersible pumps, top slab, piping, valves, valve vault, electrical panel and control panel.

- B. The CONTRACTOR shall furnish all labor, equipment, tools, services, and incidentals to complete all Work required by these Specifications and as shown on the Drawings.
- C. The CONTRACTOR shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, cleanup, replacements and restoration required as a result of damages caused during this construction.
- D. All materials, equipment, skills, tools, and labor which is reasonably and properly inferable and necessary for the proper completion of the Work in a substantial manner and in compliance with the requirements stated or implied by these Specification or Drawings shall be furnished and installed by the CONTRACTOR without additional compensation, whether specifically indicated in the Contract Documents or not.
- E. The CONTRACTOR shall comply with all City, County, State, Federal, and other codes which are applicable to this Project.

1.02 CONTRACTOR'S USE OF PREMISES

- A. The CONTRACTOR shall assume full responsibility for the protection and safekeeping of products and materials at the job site. If additional storage or work areas are required, they shall be obtained by the CONTRACTOR at no additional cost to the OWNER.

1.03 PROJECT SEQUENCE

- A. The CONTRACTOR shall establish his work sequence based on the use of crews to facilitate completion of construction and testing within the specified Contract time.

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

- A. Separate payment will be made only for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required for satisfactory completion of the work, shall be considered to be included in the scope of the appropriate listed work items.
- B. The Contractor's attention is called to the fact that cleanup is considered a part of the work of construction. No payment will be made until cleanup is essentially complete.
- C. No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work.
 - 1. Excavation, including necessary pavement base removal.
 - 2. Shoring and sheeting.
 - 3. Dewatering and disposal of surplus water.
 - 4. Structural Fill.
 - 5. Backfill.
 - 6. Grading.
 - 7. Replacement of unpaved driveways, grass and shrubbery plots.
 - 8. Cleanup.
 - 9. Testing and placing system in operation.
 - 10. Any material and equipment required to be installed and utilized for testing.
 - 11. Pipe, structures, pavement replacement and/or appurtenances included within the limits of lump sum work.
 - 12. Maintaining the existing quality of service during construction.
 - 13. Appurtenant work as required for a complete and operable system.
- D. No payment shall be made for work constructed outside the authorized limits of work.
- E. The Contractor is hereby made aware that there are Technical Specifications for items to be constructed not specifically included within these contract documents. For those items, the latest version of FDOT Specification for Road and Bridge Construction shall apply.

PART 2 - MATERIALS AND EQUIPMENT

2.01 Mobilization

Bid Item A1

The lump sum to complete this item shall be full compensation for the preparatory work and operations in mobilizing for beginning work on the Project including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of field office, building, safety equipment and first aid supplies, sanitary and other facilities, as required by these Specifications, and state and local laws and regulations; and any other pre-construction expense necessary for the start of the Work; the cost of field engineering including permits and fees, construction schedules, project signs, shop drawings, temporary facilities, laydown storage area, construction aids, work associated with contractor support during Owner/Engineer reviews and inspection, re-inspections, and any re-work resulting from same, cleaning, operation and maintenance data, and for all other work required for demobilization. The Contractor shall submit invoices substantiating the cost of mobilization and demobilization with each pay request. Ten percent (10%) for the cost for mobilization and demobilization will be withheld until acceptance and final payment.

2.02 Erosion and Sediment Control

Bid Item A2

Lump sum payment will be made based on completion of sediment and erosion control measures necessary to prevent transport of material due to construction activity, sequence of construction and environmental conditions. Payment shall be full compensation for materials, labor, equipment and work necessary to complete the work in accordance with the contract documents and City/County/State/Federal requirements. Agency notification, record keeping, hay bales, silt fence, floating turbidity barriers, settling ponds, vegetation, and other Best Management Practices.

2.03 Preconstruction Video

Bid Item A3

Lump sum payment will be made based on delivery to the City of two copies with documentation of the video for the project route. The contract lump sum price shall be full compensation for all materials and work necessary to complete the professional videotaping in accordance with the project specifications including audio and written logs. Construction work shall not start until videos are delivered and approved by the project representative. Videos shall show condition of right-of-way and yards at right-of-way.

2.04 Field Locate and Expose Existing Utilities

Bid Item A4

Payment at the applicable lump sum price will be made based on completion of exposing existing City utilities and all other utilities within the contract work limits. The contract lump sum price will be full compensation for all equipment, labor, and materials necessary to verify existing utilities within the rights-of-way or easements shown on the contract plans and provide a sketch of each major intersection or congested area with the Contractor's proposed solution to conflicts found prior to construction.

2.05 Bypass Pumping**Bid Item B1**

Lump sum payment will be made at the completion of the operational lift station for temporary bypass pumping. The bypass pumping system shall be duplex pumps and each pump shall be capable of passing the flows with one unit on standby. Temporary systems shall be automatic float operated and switch over to standby, have cellular alarm notification, and have a noise level no greater than 70 dba at seven (7) meters.

2.06 Demolition**Bid Item B2**

Lump sum payment shall be made for the demolition, removal, abandonment, filling, and/or other work to existing facilities as shown on the plans and as required to complete the required work. Restoration, including fill required, shall be included. Demolished facilities shall be shown on the as-builts. City shall have right to all abandoned equipment. CONTRACTOR shall deliver to City or dispose of properly. CONTRACTOR is responsible for proper disposal of all removed materials.

2.07 Complete Lift Station**Bid Item B3**

Lump sum payment will be made for the pumps, rails, top slab, hatch, new wetwell, valves, valve vault, yard piping, mechanical equipment, restoration, and all other items necessary for a complete installation. This includes all materials, equipment and labor required to construct the station as shown on the plans and described in the specifications. This item includes a new water service from the main.

2.08 Electrical**Bid Item B4**

Lump sum payment shall be made for the installation of all Electrical equipment, including generator, as shown on the plans and described in the specifications. Payment will be full compensation for furnishing all plant labor, materials, equipment, and electrical work to integrate and connect the new motors, lighting, control panels, junction boxes, cables, wiring, and miscellaneous components required to complete all electrical work in accordance with the contract plans, specifications, the National Electric Code and FBC. CONTRACTOR shall obtain requisite electrical permits prior to commencement of work.

2.09 Gate Valve**Bid Item B5**

Payment will be made on each installation at the applicable unit price for the installation of each valve as shown on the plans. The contract unit price will be full compensation for all materials and work necessary to complete the installation in accordance with the drawings and specifications including adjustment of valve box to final grade and shall include restrained joint attachment of valve to adjacent fittings where shown as part of this unit price. This item includes motor operators and mounting of operators with pedestals where called for.

2.10 Install 6" PVC Force Main AWWA C900 w/Fittings**Bid Item B6**

Payment will be made at the contract unit price for the provisions and installation of C900 PVC force main as detailed on the plans and described in the specifications. The unit price shall be full compensation for all excavation, materials, fittings, equipment, labor, hydrostatic testing, restoration, couplings, and all items necessary to complete the installation as shown on the plans. Pipe material fittings and couplings are included with this item. City will provide pipe and not contractor.

2.11 Tie-Ins**Bid Item B7**

Payment shall be made at the contract price for each tie in, tapping sleeve and tapping valve with valve box. The contract price shall be full compensation for all materials, equipment and labor required to complete the installation in accordance with the drawings and specifications. This item includes all fittings and appurtenances required in addition to the adjustment of valve box to final grade and concrete collar in unpaved areas.

2.12 DIP Fittings Add or Delete**Bid Item B8**

Payment shall be made at the contract unit price per pound for for all ductile iron/cast iron fittings installed by the Contractor as directed by the Engineer or Owners' Representative. This item is included in the contract to cover for the cost of additional fittings that are not shown on the project plans which are required to meet modified routing due to field conditions. Payment of the applicable unit price per pound shall include the cost of providing and installing restrained joints as both end of each additional fitting installed. This contract unit price will apply as a credit for all fittings that are deleted from those shown to be needed on the contract plans. The credit will apply to fittings shown to be needed on the project plans that are not installed.

2.13 Permits and Allowances**Bid Item B9**

An allowance is established to pay costs associated with building permit fees and ancillary costs associated with construction of the lift station improvements. No provisions for mark-up are included within the allowance. The contractor shall provide documentation for payment toward this allowance for approval by Owner prior to including in pay request.

2.14 Lift Station As-Built Plans**Bid Item B10**

Lump sum payment will be made based on delivery of record drawings produced by a licensed surveyor conforming to the specifications. Periodical record drawings shall be submitted with each pay estimate on which the Engineer shall rely to ensure the improvements are constructed in accordance with the design locations and elevations. Progress payments submitted without updated record drawings to document work constructed that pay period shall be a basis for rejection of the pay request until such time as adequate record drawings are submitted.

2.15 Open Cut and Repair Asphalt**Bid Items B11**

Payment will be made at the applicable unit price for all road base repairs, as specified and match existing paving thickness per the plan details including removal and disposal of the areas to be restored and saw cutting of edges of existing material. The contract unit price shall be full compensation for all material and work necessary to complete the repair or installation in accordance with DOT specifications. Stabilized sub-base to be excavatable flowable fill bridged 1 ft both sides of cut area, limerock and ABC-3 shall be in accordance with DOT specifications. Limerock shall be prime and sand sealed and this cost shall be included in the unit cost of the base. DOT ABC-3 base shall be used in Volusia County and City of Holly Hill right-of-way areas where the ABC-3 shall be installed 9 inches thick. Asphalt overlay to be minimum 2" type SP9.5 bridged 1 ft both sides of sub-base area.

**2.16 Concrete Pavement, Remove & Replace
(Fiber Reinforced 3000 psi concrete)****Bid Item C1**

Payment will be made at the applicable unit price for removal and replacement of existing concrete driveways and sidewalks as shown on the plans. All driveways shall be 6 inches thick and sidewalks 4 inches thick, both shall be constructed to City standards. Driveways reconstructed shall be as directed in the field by the owner's project representative. No separate payment will be made for dirt or shell driveways as restoration cost for those driveways shall be contained in the pipe unit price. Payment shall be made per square yard satisfactorily installed. This item includes saw cutting of existing driveways, and demolition and removal of existing drives.

2.17 Sod – Argentine Bahia**Bid Item C2**

Payment shall be made at the applicable unit price for Argentine Bahia sod installed and shall be full compensation for furnishing all plant labor, materials and equipment necessary to furnish and properly install sod within the limits shown on the Drawings. Item shall include watering and maintenance for a one-month period. Dead or insect infested/sod shall be replaced by the Contractor at no cost to the Owner if manifestation of damage becomes apparent within the one month maintenance period.

2.18 Compliance with Florida "Trench Safety Act"**Bid Item C3**

Lump sum payment will be made based on the contractor's full and complete compliance with the State of Florida Trench Safety Act. Payment shall be made as a percentage of this item based on the percent of overage utility installation work completed.

2.19 Unsuitable Material Excavation**Bid Item C4**

Where field conditions indicate the necessity for removing unsuitable material or muck from trench or roadway area excavations; and where such excavations require the removal of muck or other unsuitable material as determined by the Engineer, and replacement with suitable material, payment

will be made at the contract unit price per cubic yard in situ for such muck or other unsuitable material removed and replaced with clean fill upon the basis of in place measurement of the material removed.

2.20 Crushed Rock or Shell Trench Subgrade Material

Bid Item C5

Where field conditions necessitate the provision of select subgrade material, payment will be made at the contract unit price per cubic yard for approved crushed rock or shell material placed in trench or structure excavations. Payment will be made only when placement of material is directed by the Engineer.

2.21 Rock Excavation

Bid Item C6

Payment shall be made at the applicable unit price when, in the Engineers opinion, field conditions indicate the necessity for removing rock from trench excavations; and where such excavations require the removal of rock as determined by the Engineer, and replacement with suitable material, payment shall be made at the applicable unit price per cubic yard for such rock removed and replaced with clean fill upon the basis of in place measurement of the cemented material removed. Payment shall not be made for trench widths wider than six (6) feet, or in areas where the material removed can be “co-mingled” with other backfill above the pipe envelope with the backfilling operation.

END OF SECTION

SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Submit to the Engineer a Schedule of Values allocated to the various lump sum portions of the Work, at the Pre-Construction Conference, and as otherwise specified or requested to be submitted earlier as evidence of the Apparent Low Bidder's qualifications.
2. Upon request of the Engineer support the values with data which will substantiate their correctness. The data shall include, but not be limited to quantity of materials, all sub-elements of the activity, and their units of measure.
3. The Schedule of Values shall establish the actual value for each activity of the Work to be completed taken from the approved Critical Path Method (CPM) Construction Schedule, and shall be used as the basis for the Contractor's Applications for Payment.

B. Related Requirements Described Elsewhere:

1. Conditions of the Construction Contract.

1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Type schedule on 8-1/2 inch x 11-inch white paper. Contractor's standard forms and computer printouts may be considered for approval by the Engineer upon Contractor's request. Identify schedule with:
1. Title of project and location.
 2. Owner and purchase order number.
 3. Engineer and project number.
 4. Name and address of Contractor.
 5. Contract designation.
 6. Date of submission.

- B. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing item prices for progress payments during construction.
- C. Identify each line item with the number and the title of the respective section of the Specifications.
- D. For each major item of the Work, list sub-values of major products or operations under the major item.
- E. For the various portions of the Work:
 - 1. The amount for each item shall reflect a total installed cost including a directly proportional amount of the Contractor's overhead and profit.
 - 2. For items on which progress payments will be requested for stored materials, break down the value into:
 - a. The cost of the materials, delivered and unloaded, with taxes paid. Paid invoices are required for materials. Payment for materials shall be limited to the invoiced amount only.
 - b. The total installed value.
- F. Round off figures to nearest dollar amount.
- G. The sum of the costs of all items listed in the schedule shall equal the total Contract Price.
- H. For each item which has an installed value of more than \$15,000, provide a breakdown of costs to list major products or operations under each item.
- I. The form of the Schedule of Values shall parallel the form presented in Section 00845: Schedule of Values.

1.03 SUB-SCHEDULE OF UNIT MATERIAL VALUES

- A. Submit a separate schedule of unit prices for materials to be stored on site and for those materials incorporated into the Work for which progress payments will be requested.
- B. Format shall parallel that shown in Section 00 84 60: Materials Stored On Site Form.
- C. The unit values for the materials shall be broken down into:

1. Cost of the material, delivered and unloaded at the site, with taxes paid.
 2. Copies of paid invoices for component material shall be included with the payment request in which the material first appears.
- D. Only materials unique to the project may be billed when stored on site. Materials of standard use such as conduit, wire, small-diameter pipe, steel, etc., shall not be accepted for payment.
- E. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

1.04 REVIEW AND RESUBMITTAL

- A. After review by Engineer, revise and resubmit Schedule of Values and Schedule of Unit Material Values as required.
- B. Resubmit revised schedules in same manner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 76
PROGRESS PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Submit Application for payment to the ENGINEER on accordance with schedule established by Conditions of the Contract and Agreement between OWNER and CONTRACTOR. CONTRACTOR shall use the Application and Certificate for Payment Form included on Section 00 84 40 as the official pay request form.
- B. Related Requirements Described Elsewhere:
 - 1. Agreement: Section 00 50 00.
 - 2. Construction Progress Schedule: Section 01 32 16.
 - 3. Schedule of Values: Section 01 29 73.
 - 4. Photographic Documentation: Section 01 32 33.
 - 5. Project Record Documents: Section 01 78 39.

1.02 FORMAT REQUIRED

- A. Submit applications typed on the form provided in Division 0, Section 00 84 40: Application and Certificate for Payment Form, with itemized data typed on eight and one-half inch by 11 inch (8-1/2" x 11") or white paper continuation sheets.
- B. Provide itemized data on continuation sheets of format, schedules, line items, and values specified on the Application and Certificate for Payment Form. The CONTRACTOR shall use the item descriptions and contract values included in schedule of values, approved, and accepted by the ENGINEER as a basis for preparation of the Application for Payment Form.

1.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

- A. Application Form:
 - 1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in percent complete for each activity and dollar values to agree with respective percent's.
3. Execute certification with signature of a responsible officer of CONTRACTOR.

B. Continuous Sheets:

1. Fill in total of all scheduled component items of the Work, with item number and schedule dollar value for each item.
2. Fill in dollar value in each column for each scheduled line item when Work has been performed or products stored. Round off values to nearest dollar, or as specified for Schedule of Values.
3. List each Change Order executed prior to date of submission, at the end of the continuation sheets. List by Change Order Number, and description, as for an original component item Work.
4. To receive approval for payment on component material stored on site, submit copies of the original invoices with Application and Certificate for Payment.
5. As provided for in the Application and Certificate for Payment Form, the CONTRACTOR shall certify, for each current pay request, that all previous progress payments received from the OWNER, under this Contract, have been applied by the CONTRACTOR to discharge in full, all obligations of the CONTRACTOR in connection with Work covered by prior Applications for Payment, and all materials and equipment incorporated into the Work are free and clear of all liens, claims, security interest, and encumbrances. CONTRACTOR shall attach to each Application and Certificate for Payment like affidavits by all Subcontractors.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. CONTRACTOR shall submit suitable information, with a cover letter identifying:
1. Project.
 2. Application number and date.
 3. Detailed list of enclosures.

4. For stored products:

- a) Item number and identification as shown on application.
- b) Description of specific material.

- B. Submit one (1) copy of data and cover letter for each copy of application.
- C. The CONTRACTOR is to maintain an updated set of drawings to be used as record drawings in accordance with Section 01 78 39: Project Record Documents. As a prerequisite for monthly progress payments, the CONTRACTOR is to exhibit the updated record drawings for review by the OWNER and the ENGINEER.
- D. Each monthly application for payment shall incorporate the corresponding “monthly progress status report” and updated construction schedule, prepared in accordance with the requirements of Section 01 32 16: Construction Progress Schedule.
- E. As a prerequisite for payment, CONTRACTOR shall submit a duly executed letter from surety consenting to payment due and progress to date.
- F. Provide construction photographs in accordance with Section 01 32 33: Photographic Documentation.

1.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. Fill in application form as specified for progress payments. Provide information as required by the General Conditions and Section 01 77 00: Closeout Procedures.
- B. Furnish evidence of completed operations and insurance in accordance with the General Conditions.
- C. Provide CONTRACTOR’s Final Release of Lien (Section 00 84 90) and other close-out submittals as required by the General Conditions.

1.06 SUBMITTAL PROCEDURE

- A. Submit Application for Payment to the ENGINEER at the time stipulated in the Agreement, or as agreed to at the pre-construction meeting. Review the percent’s complete with the ENGINEER and resolve any conflict or discrepancies.
- B. Application for payment to be submitted electronically in color for processing and payment.

- C. When the ENGINEER finds the Application and Certificate for Payment Form is properly completed and correct, he will execute the Certificate for Payment and transmit the forms to the OWNER, with a copy to the CONTRACTOR.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The CONTRACTOR shall coordinate with the ENGINEER to schedule and administer the preconstruction meeting, resident meeting, utility coordination, periodic progress meetings, and specifically called meetings throughout the progress of the Work.
2. The ENGINEER shall:
 - a. Prepare agenda for meetings.
 - b. Make physical arrangements for meetings.
 - c. Preside at meetings.
 - d. Take and distribute meeting minutes.
3. The CONTRACTOR shall:
 - a. Attend all meetings along with pertinent subcontractors and suppliers.
 - b. Appoint attendees who are qualified and authorized to act on behalf of the entity each represents.
 - c. Provide requested information at meetings.
4. The OWNER shall:
 - a. Attend meetings to ascertain that the Work is expedited consistent with Contract Documents and construction schedules.

B. Related Requirements Described Elsewhere:

1. Construction Progress Schedules: Section 01 32 16.
2. Shop Drawings: Section 01 33 23.
3. Project Record Documents: Section 01 78 39.

1.02 PRECONSTRUCTION MEETING

- A. Purpose: To initiate coordination of contractual requirements prior to start of work.
- B. Scheduling: ENGINEER will schedule a preconstruction meeting after execution of the Contract. Invites shall be sent via electronic mail.
- C. Location: A local site, convenient for all parties, designated by the ENGINEER.
- D. Attendance:
 - 1. OWNER's representative.
 - 2. ENGINEER and his sub-consultants.
 - 3. Resident project representative.
 - 4. CONTRACTOR and his superintendent.
 - 5. Major subcontractors.
 - 6. Representatives of major suppliers and manufacturers, as appropriate.
 - 7. Governmental and franchised utility representatives, as appropriate.
 - 8. Permit agency representatives, as appropriate.
 - 9. Funding agency representatives, as appropriate.
 - 10. Others as requested by the CONTRACTOR, OWNER, and ENGINEER.
- C. Suggested Agenda:
 - 1. Introductions and Roles.
 - 2. Contract Execution and Dates.
 - a. Contracts.
 - b. Contract Time/Dates.
 - c. Copies of Conformed Documents.
 - 3. Communications.
 - a. Lines of Communication.
 - b. Coordination Meetings.

- c. Contact List.
 - d. Requests for Information (RFIs).
- 4. Preconstruction Matters.
 - a. Submittals.
 - b. Material Acquisition.
 - c. Mobilization.
 - d. Permitting.
- 5. Construction/Coordination.
 - a. Working Days/Hours.
 - b. Change Orders.
 - c. Locating Existing Facilities.
 - d. Demolition.
 - e. Testing.
 - f. Updated Schedules.
- 6. Pay Requests.
 - a. Process.
 - b. Schedule of Values.
 - c. Stored Materials.
 - d. Preliminary As-Builts.
- 7. Contract Closeout.
 - a. Substantial Completion.
 - b. Punch-list.
 - c. Final Acceptance.
 - d. Warranty.
 - e. Final Payment.

1.03 RESIDENT MEETING(S)

- A. Purpose: To present construction approach to effected residents and to allow residents to ask questions concerning such.
- B. Scheduling: ENGINEER/OWNER will schedule resident meeting(s) after preconstruction meeting is held, but before construction begins. Invites shall be distributed via electronic mail and hard copy flyers. CONTRACTOR shall assist in the distribution of flyers.
- C. Location: A local site, convenient for all parties, designated by the ENGINEER/OWNER.

D. Attendance:

1. OWNER's representative.
2. ENGINEER.
3. Resident project representative.
4. CONTRACTOR and his superintendent.
5. Major subcontractors, as appropriate.
6. Residents.

E. Suggested Agenda: To be determined by ENGINEER/OWNER.

1.04 UTILITY COORDINATION MEETING(S)

- A. Purpose: To discuss the coordination of the construction with existing and proposed utilities.
- B. Scheduling: ENGINEER will schedule utility coordination meeting(s) as needed. These meetings may be held in conjunction with Progress Meetings. Invites shall be distributed via electronic mail.
- C. Location: A local site, convenient for all parties, designated by the ENGINEER.
- D. Attendance:
1. OWNER's representative.
 2. ENGINEER.
 3. Resident project representative.
 4. CONTRACTOR and his superintendent.
 5. Major subcontractors, as appropriate.
 6. Utility representatives.
- E. Suggested Agenda: To be determined by ENGINEER.

1.05 PROGRESS MEETINGS

- A. Purpose: To discuss the progress of the construction and projected work activities.
- B. Scheduling: ENGINEER will schedule progress meetings on a regular basis at a minimum frequency of once per week and at a maximum frequency of once per month. Invites shall be distributed via electronic mail.
- C. Location: A local site, convenient for all parties, designated by the ENGINEER.
- D. Attendance:
 - 1. OWNER's representative.
 - 2. ENGINEER and sub-consultants, as appropriate.
 - 3. Resident project representative.
 - 4. CONTRACTOR and his superintendent.
 - 5. Major subcontractors, as appropriate.
 - 6. Utility representatives, as appropriate.
 - 7. Permit agency representatives, as appropriate.
 - 8. Funding agency representatives, as appropriate.
- E. Suggested Agenda:
 - 1. Work progress since last meeting.
 - 2. Work scheduled this period.
 - 3. Field observations, problems, and conflicts.
 - 4. Construction schedule.
 - a. Status of current schedule.
 - b. Issues impacting schedule.
 - c. Fabrication and delivery schedules.
 - d. Corrective measures to regain projected schedule.
 - 5. Submittals.
 - 6. RFIs.
 - 7. Pending Changes and Substitutions.
 - 8. Quality Control.

9. Pay Requests.
10. Other Business.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Promptly after award of the Contract, prepare and submit to the Engineer estimated construction progress schedules demonstrating complete fulfillment of all Contract requirements utilizing a Critical Path Method (hereinafter referred to as CPM) in planning, coordinating, and performing the Work under this Contract (including all activities of subcontractors, equipment vendors, and suppliers). The principles and definition of CPM terms used herein shall be as set forth in the Associated General Contractors of America (AGC) publication, The Use of CPM in Construction, A Manual for General Contractors and the Construction Industry, latest edition, but the provisions of this Specification shall govern the planning, coordinating, and performance of the Work.
2. Submit revised progress schedules on a monthly basis. No partial payments shall be approved until there is an approved construction progress schedule on hand.

B. Related Requirements Described Elsewhere:

1. Conditions of the Contract.
2. Summary of Work: Section 01 11 00.
3. Project Meetings: Section 01 31 19.
4. Progress Payment Procedures: Section 01 29 76
5. Shop Drawings: Section 01 33 23.

1.02 QUALIFICATIONS

- A. A statement of computerized CPM capability shall be submitted in writing prior to the award of the Contract and shall verify that either Contractor's organization has in-house capability to use the CPM technique or that Contractor will employ a CPM consultant who is so qualified.
- B. In-house capability shall be verified by description of construction projects to which Contractor or Contractor's consultant has successfully applied computerized CPM

and shall include at least two (2) projects valued at least half the expected value of this project.

1.03 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart.
 - 1. Provide a separate horizontal bar for each trade or operation within each structure or item.
 - 2. Horizontal time scale:
 - a. Show starting and completion dates for each activity in terms of the number of days after Notice to Proceed. All completion dates shown shall be within the period specified for contract completion.
 - b. Identify the first work day of each month.
 - 2. Scale and Spacing: Sufficient to allow space for notations and future revisions.
 - 4. Maximum Sheet Size: 24 inches by 36 inches.
- B. Format of Listings: The chronological order of the start of each item of work for each structure.
- C. Identification of Listings: By major specification section numbers as applicable and by utility.
- D. Construction Progress Schedules shall be computer generated using software equal to Primavera Project Planner for Windows by Primavera Systems, Inc., Bala Cynwyd, P.A., or approved equal.

1.04 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity and by structure.
 - 2. Show the dates for the beginning and completion of each major element of construction in no more than a two (2) week increment scale. Specifically list, but do not limit to:
 - a. Shop Drawing Schedule.
 - b. Installation of temporary facilities.

- c. Clearing.
 - d. Demolition
 - e. Subcontractor work
 - f. Utility Installations
 - g. Paving
 - h. Start-Up
 - i. Project closeout
- 3. Show projected percentage of completion for each item, as of the first day of each month.
- 4. Show projected dollar cash flow requirements for each month of construction and for each activity as indicated by the approved Schedule of Values.
- B. Submittals for construction progress schedules shall be in accordance with Section 01 33 23: Shop Drawings. Indicate on the schedule the following:
 - 1. The dates for Contractor's submittals.
 - 2. The date submittals will be required for Owner-furnished products, if applicable.
 - 3. The date approved submittals will be required from the Engineer.
- C. A typewritten list of all long lead items (equipment, materials, etc.).
- D. To the extent that the progress schedule or any revised progress schedule shows anything not jointly agreed upon or fails to show anything jointly agreed upon, it shall not be deemed to have been approved by the Engineer. Failure to include any element of work required for the performance of this Contract shall not excuse the Contractor from completing all work required within any applicable completion date, notwithstanding the Engineer's approval of the progress schedule.
- E. Scheduling Constraints: The work within Owner's property must be completed within the maximum number of days start to finish, as indicated in the Contract. Additionally, work must proceed on a continuous basis, without stoppages, except for nights and weekends. There shall be no lapses between phases of construction.

1.05 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.

4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
1. Problem areas, anticipated delays, and the impact on the schedule.
 2. Corrective action recommended, and its effect.
 3. The effect of changes on schedules of other prime contractors.
- D. If the Work falls behind the critical path schedule by two (2) weeks or more, the Contractor shall prepare a recovery schedule.

1.06 SUBMISSIONS

- A. Submittal Requirements.
1. Logic network and/or time-phased bar chart, computer generated.
 2. Computerized network analysis:
 - a. Sort by early start
 - b. Sort by float
 - c. Sort by predecessor/successor
 3. Narrative description of the logic and reasoning of the schedule.

B. Time of Submittals.

Within ten (10) working days after Notice to Proceed, Contractor shall submit a network diagram describing the activities to be accomplished in the project and their dependency relationships, (predecessor/successor) as well as a tabulated schedule as herein defined. The total length of time indicated on the initial CPM schedule shall equal the exact number of days in the Contract Time as defined in Section 00 50 00: Agreement. The schedule produced and submitted shall also indicate calendar dates, including project starting and completion dates, based on the Contract Commencement and completion dates indicated in the Notice to Proceed. The Engineer will complete the review of the complete schedule within fifteen (15) working days after receipt. During the review process, the Engineer may meet with a representative of Contractor to review the proposed plan and schedule to discuss any clarifications that may be necessary.

- C. Within ten (10) working days after the conclusion of the Engineer's review period, Contractor shall revise the network diagram as required and resubmit the network diagram and a tabulated schedule produced therefrom. The revised network diagram and tabulated schedule shall be reviewed and accepted or rejected by the Engineer within fifteen (15) working days after receipt. The network diagram and tabulated

schedule, when accepted by the Engineer, shall constitute the project work schedule unless a revised schedule is required due to substantial changes in the Work, a change in Contract Time or a recovery schedule is required and requested.

- D. Acceptance. The finalized schedule will be acceptable to the Engineer when, in the opinion of the Engineer, it demonstrates an orderly progression of the Work to completion in accordance with the Contract Documents. Such acceptance will neither impose on the Engineer responsibility for the progress or scheduling of the Work nor relieve Contractor from full responsibility therefore. The finalized schedule of shop drawing submittals will be acceptable to the Engineer when, in the opinion of the Engineer, it demonstrates a workable arrangement for processing the submittals in accordance with the requirements. The finalized Schedule of Values (lump sum price breakdown), as applicable, will be acceptable to the Engineer as to form and content when, in the opinion of the Engineer, it demonstrates a substantial basis for equitably distributing the Contract Price. When the network diagram and tabulated schedule have been accepted, the Contractor shall submit to the Engineer six (6) copies of the time-scaled network diagram, six (6) copies of a computerized tabulated schedule in which the activities have been sequenced by numbers, six (6) copies of a computerized tabulated schedule in which the activities have been sequenced by early starting date, and six (6) copies of a computerized, tabulated schedule in which activities have been sequenced by total float, and six (6) copies sorted by predecessor/successor.

- E. Revised Work Schedules. Contractor, if requested by the Engineer, shall provide a revised work schedule if, at any time, the Engineer considers the completion date to be in jeopardy because of "activities behind schedule." The revised work schedule shall include a new diagram and tabulated schedule conforming to the requirements of Paragraph 1.09 herein, designed to show how Contractor intends to accomplish the Work to meet the completion date. The form and method employed by Contractor shall be the same as for the original work schedule. No payment will be made if activities fall more than two (2) weeks behind schedule and a revised work schedule is not furnished.

- F. Schedule Revisions. The Engineer may require Contractor to modify any portions of the work schedule that become infeasible because of "activities behind schedule" or for any other valid reason. An activity that cannot be completed by its original latest completion date shall be deemed to be behind schedule. No change may be made to the sequence, duration, or relationships of any activity without approval of the Engineer.

1.07 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 - 1. Engineer.
 - 2. Jobsite file.
 - 3. Subcontractors.
 - 4. Other concerned parties.
 - 5. Owner (two copies).
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

1.08 CHANGE ORDERS

- A. Upon approval of a change order, the approved changes shall be reflected in the next scheduled revision or update submittal of the construction progress schedule by the Contractor.

1.09 CPM STANDARDS

- A. CPM, as required by this Section, shall be interpreted to be generally as outlined in the Associated General Contractors (AGC) publication, The Use of CPM in Construction, A Manual for General Contractors and the Construction Industry, Copyright 1976.
- B. Work schedules shall include a graphic network and computerized, tabulated schedules as described below. To be acceptable the schedule must demonstrate the following:
 - 1. A logical succession of work from start to finish.
 - 2. Definition of each activity. Activities shall be identified by major specification section numbers, as applicable, and by major utility.
 - 3. A logical flow of work crews/equipment (crews are to be defined by manpower category and man-hours; equipment by type and hours).
 - 4. Show all work activities and interfaces including submittals as well as major material and equipment deliveries.

C. Networks.

1. The CPM network, or diagram, shall be in the form of a time-scaled diagram of the customary activity-on-type and may be divided into a number of separate pages with suitable notation relating the interface points among the pages. Notation on each activity line shall include a brief work description and duration, as described in Paragraph 1.09, D. herein.
2. All construction activities and procurement shall be indicted in a time-scaled format, and a calendar shall be shown on all sheets along the entire sheet length. Each activity arrow shall be plotted so the beginning and completion dates of said activity can be determined graphically by comparison with the calendar scale. All activities shall be shown using the symbols that clearly distinguish between critical path activities, non-critical path activities, and float for each non-critical activity. All non-critical path activities shall show estimated performances time and float time in scaled form.

D. The duration indicated for each activity shall be in calendar days and shall represent the single best time considering the scope of the work and resources planned for the activity including time for inclement weather. Except for certain non-labor activities, such as curing concrete or delivering materials, activity durations shall not exceed fourteen (14) days nor be less than one (1) day unless otherwise accepted by the Engineer.

E. Tabulated Schedules. The initial schedule shall include the following minimum data for each activity.

1. Activity Beginning and Ending Numbers (i-j numbers) (single activity numbers may be used).
2. Duration.
3. Activity Description.
4. Early Start Date (Calendar Dated).
5. Late Start Date (Calendar Dated).
6. Early Finish Date (Calendar Dated).
7. Late Finish Date (Calendar Dated).
8. Identified Critical Path.
9. Total Float (Note: No activity may show more than 20 days float).
10. Cost of Activity.
11. Equipment Hours, by type; Man-Power Hours, by crew or trade.

F. Project Information. Each tabulation shall be prefaced with the following summary data:

1. Project Name.

2. Contractor.
3. Type of Tabulation (Initial or Updated).
4. Project Duration.
5. Project Scheduled Completion Date.
6. Effective or Starting Date of the Schedule.
7. New Project Completion Date and Project Status (if an updated or revised schedule).
8. Actual Start Date and Actual Finish Date (for all updated schedules.)

1.10 SCHEDULE MONITORING

- A. At not less than monthly intervals or when specifically requested by Engineer, Contractor shall submit to the Engineer a computer printout of an updated schedule for those activities that remain to be completed. Typically, the updated schedule will be submitted with the application for payment as specified below.
- B. The updated schedule shall be submitted in the form, sequence, and number of copies requested for the initial schedule.

1.11 PROGRESS MEETINGS

- A. For the monthly progress meeting, Contractor shall submit a revised CPM schedule and a three-week look-ahead schedule, showing all activities completed, in progress, uncompleted, or scheduled to be worked during the weeks. The three weeks include the current week plus the next two weeks. All activities shall be from the approved CPM and must be as shown on the CPM unless behind or ahead of schedule. One copy of the revised CPM schedule shall be submitted with each copy of that month's application for payment, electronically in color.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Scope of Work: The CONTRACTOR shall employ a competent photographer to take construction record photographs and video recording prior to start of work and periodically during the course of the Work.
- B. Related Requirements Described Elsewhere:
 - 1. Project Requirements: Section 01 00 00.
 - 2. Summary of Work: Section 01 11 00.
 - 3. Location, Scope, and Special Requirements: Section 01 35 00.
 - 4. Project Record Documents: Section 01 78 39.

1.02 PHOTOGRAPHY REQUIRED

- A. Digital photographs shall be taken in conformance with this Section shall be furnished to the ENGINEER with each pay request. Failure to comply will result in rejection of pay request.
- B. Digital photographs shall be taken at each of the major stages of construction and as directed by the ENGINEER.
- C. Digital photographs may be taken by the CONTRACTOR's personnel but must be of professional quality as herein specified. Photographs which are deemed unsatisfactory will be rejected and retakes will be required.
- D. Views and Quantities Required:
 - 1. CONTRACTOR shall supply Digital pictures on a minimum four (4) GB USB Flash Drive. One (1) view of each activity, as directed by the Resident Project Representative, up to a limit of ten activities photographed per month.
 - 2. One (1) Digital picture of five (5) views of overall Project site monthly including any change of condition, any structural changes, relocation, and

all conflicts with utilities, as directed by the Resident Project Representative.

E. Digital pictures shall contain and comply with the following:

1. The CONTRACTOR shall maintain all Digital copies of photos for the entire Project and then shall convey the disks to the OWNER at the completion of the Project.
2. All disks shall be properly labeled with project name, project number, project start and end dates, CONTRACTOR's name, and OWNER's name for which work was completed.
3. The photographer shall agree to furnish additional disks to OWNER and the ENGINEER at commercial rates applicable at time of purchase.

1.03 COST OF PHOTOGRAPHY

- A. The CONTRACTOR shall pay costs for specified Digital photography and any required prints.

PART 2 – PRODUCTS

2.01 DIGITAL PHOTOGRAPH AND/OR PRINTS

A. Type of Print (if required):

1. Paper: Single weight, color print paper.
2. Finish: Smooth surface, glossy.
3. Size: Four inch x six inch (4" x 6") for construction photos.

B. Identify each photograph with the following (each print shall have information listed on back of each photograph and digital pictures shall have coordinating log sheet with information):

1. Name of project.
2. Orientation of view.
3. Date and time of exposure.
4. Name and address of photographer.
5. Each photograph shall be numbered in consecutive order.

Note: Digital prints shall be used to clarify as-builts.

PART 3 – EXECUTION

3.01 TECHNIQUE

- A. Factual Presentation.
- B. Correct exposure and focus.
 - 1. High resolution and sharpness (minimum 800 DPI).
 - 2. Maximum depth-of-field.
 - 3. Minimum distortion.

3.02 VIEWS REQUIRED

- A. Digital photographs shall adequately illustrate condition of construction and state of progress.
 - 1. At successive periods of photography, take at least one (1) digital photograph from the same overall view as previously photographed.
 - 2. Consult with the ENGINEER at each period of digital photography for instructions concerning views required.

3.03 DELIVERY OF PRINTS

- A. Deliver photographs, on USB Flash Drive with coordinating log, to the ENGINEER as attachment to Application for Payment. (Flash Drive will become property of ENGINEER and/or client)
- B. Distribution of construction photographs, as soon as processed, is anticipated to be as follows:
 - 1. ENGINEER [one (1) set].
 - 2. Project record file [one (1) set to be stored by CONTRACTOR until the end of the project which shall be delivered with Project Record Documents as specified in Section 01 78 39].
 - 3. CONTRACTOR [one (1) set].

END OF SECTION

SECTION 01 32 36

VIDEO MONITORING AND DOCUMENTATION

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, and equipment to furnish color audio video recording of the project site as specified herein.
- B. Related Requirements Described Elsewhere:
 - 1. Project Requirements: Section 01 00 00.
 - 2. Summary of Work: Section 01 11 00.
 - 3. Location, Scope, and Special Requirements: Section 01 35 00.
 - 4. Project Record Documents: Section 01 78 39.
- C. Furnish to the ENGINEER an original and one copy of a continuous color audio video recording on DVD around the entire project site. The recording shall be taken prior to any construction activity.
- D. The ENGINEER reserves the right to reject the audio video recording because of poor quality, unintelligible audio or uncontrolled pan or zoom. Any DVD rejected by the ENGINEER shall be redone at no cost to the OWNER. Under no circumstances shall construction begin until the ENGINEER has received and accepted the audio video DVD(s).
- E. The recording shall be performed by a qualified, established audio video recording firm, knowledgeable in construction practices which have a minimum of one (1) year experience in the implementation of established inspection procedures.

1.02 COLOR AUDIO VIDEO SURVEY

- A. Complete coverage shall include all surface features located within the project site, easement areas, and adjacent private properties covering the extent of the project site to be utilized by the CONTRACTOR and will be supported by appropriate audio description made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, ditches, roadways including viaducts, landscaping, trees, culverts,

headwalls, and retaining walls, and buildings located within the area. Video coverage shall extend to the maximum height of all structures within this zone.

- B. All recording shall be done during times of good visibility. No recording shall be done during periods of visible precipitation, or when more than ten percent of the ground area is covered with standing water, unless otherwise authorized by OWNER.

1.03 COST OF VIDEOGRAPHY

- A. The CONTRACTOR shall pay costs for specified videography and any required digital copies.

PART 2 – PRODUCTS

2.01 AUDIO AND VIDEO

- A. CONTRACTOR shall furnish continuous color, audio-video DVD(s) of professional quality.
- B. Pre- and post-construction recording should be recorded on a DVD-R disk, 4.7 gigabits, recorded in SP mode (120 mins) or better (HQ, HSP), disk must be finalized with no editing of information and must be properly marked with date, location, CONTRACTOR's name, job site, and name of Videographer. The date and time stamp must be visible at all times on image and disk must be stored in an individual sleeve.
- C. Each DVD shall begin with the OWNER's name, Contract name and number, CONTRACTOR's name, date, and location information such as street name, direction of travel, viewing side, etc.
- D. Information appearing on the DVD must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.
- E. Digital information will be as follows:
 - 1. Upper left corner:
 - a. Name of CONTRACTOR.
 - b. Day, date, and time.
 - c. Name of project.

2. Lower left corner:
 - a. Route of travel.
 - b. Viewing side.
 - c. Direction of travel.
 - d. Stationing.
- F. Time must be accurate and continuously generated.
- G. Engineering station numbers must be continuous, be accurate and correspond to project stationing. The symbols should be the standard engineering symbols (i.e. 16+64).
- H. Written documentation must coincide with the information on the DVD so as to make easy retrieval of location sought for at a later date.
- I. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photography negatives.
- J. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary will be given for unusual conditions of buildings, sidewalks and curbing, foundations, trees, and shrubbery, etc.
- K. All DVDs and boxes shall bare labels with the following information:
 1. Recording Number.
 2. OWNER's Name.
 3. Date of Recording.
 4. Project Name and Number.
 5. Location and Standing Limit of DVD.
- L. Prior to commencement of audio video recording, the CONTRACTOR shall notify the ENGINEER in writing when and where the audio video recording will begin. The ENGINEER may provide a designated representative to accompany and oversee coverage of all recording operations. Audio video recording completed without an ENGINEER representative present will be unacceptable unless specifically authorized by the ENGINEER.

PART 3 – EXECUTION

3.01 TECHNIQUE

- A. Factual Presentation.
- B. Correct exposure and focus.
 - 1. High resolution and sharpness.
 - 2. Maximum depth-of-field.
 - 3. Minimum distortion.

3.02 VIEWS REQUIRED

- A. Videos shall adequately illustrate condition of construction and state of progress.
 - 1. At successive periods of videography, take at least one video from the same overall view as previously videoed.
 - 2. Consult with the ENGINEER at each period of videography for instructions concerning views required.

3.03 DELIVERY OF VIDEOS

- A. Deliver videos, on USB Flash Drive with coordinating log, to the ENGINEER as attachment to Application for Payment. (Flash Drive will become property of ENGINEER and/or client)
- B. Distribution of construction videos, as soon as processed, is anticipated to be as follows:
 - 1. ENGINEER [one (1) set].
 - 2. Project record file [one (1) set to be stored by CONTRACTOR until the end of the project which shall be delivered with Project Record Documents as specified in Section 01 78 39].
 - 3. CONTRACTOR [one (1) set].

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall submit to the ENGINEER for review and approval, such working drawings, shop drawings, test reports and data on materials and equipment, and material samples materials list, certificates and affidavits as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
- B. Within 20 calendar days after the Effective Date of the Agreement, the CONTRACTOR shall submit to the ENGINEER a complete materials list of preliminary data on items for which Shop Drawings are to be submitted. Included in this materials list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the ENGINEER shall in no way be expressed or implied relief to the CONTRACTOR from submitting complete Shop Drawings and providing material, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings.
- C. The CONTRACTOR shall maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the OWNER and the ENGINEER. This log shall include the following items:
 - 1. Submittal – Description and Number assigned.
 - 2. Date to ENGINEER.
 - 3. Date returned to CONTRACTOR (from ENGINEER).
 - 4. Status of Submittal (Approved, Approved as Noted, Not Approved/Resubmit).
 - 5. Date of Re submittal and Return (as applicable).
 - 6. Date material release (for fabrication).
 - 7. Projected date of fabrication.
 - 8. Projected date of delivery to site.

9. Status of O&M manuals submitted.
10. Specification Section.
11. Drawings Sheet Number.

1.02 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the CONTRACTOR to check all drawings, data and samples prepared by or for him before submitting them to the ENGINEER for review. Each and every copy of the drawings and data shall bear CONTRACTOR's stamp and signature showing that they have been so checked. Shop drawings submitted to the ENGINEER without the CONTRACTOR's stamp and signature will be returned to the CONTRACTOR for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents. If the CONTRACTOR takes exception to the specifications, the CONTRACTOR shall note the exception in the letter of transmittal to the ENGINEER. Shop drawings submittals shall not be used as a vehicle for requesting approval of substitute or alternative equipment and materials. Substitution requests will be considered only when submitted in accordance with the applicable provisions of Section 01 60 00.
- B. Determine and Verify:
 1. Field measurements.
 2. Field construction criteria.
 3. Catalog numbers and similar data.
 4. Conformance with Specifications.
- C. The CONTRACTOR shall furnish the ENGINEER a schedule of Shop Drawings submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- D. The CONTRACTOR shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the ENGINEER, with approval.
- E. The CONTRACTOR shall submit to the ENGINEER all drawings and schedules sufficiently in advance of construction requirements to provide no less than 30 calendar days for checking and appropriate action from the time the ENGINEER receives them.

- F. All submittals shall be accompanied by a transmittal letter prepared in duplicate containing the following information:
1. Date.
 2. Project Title and Number.
 3. CONTRACTOR's name and address.
 4. The number of each Shop Drawing, Product Data, and Sample submitted.
 5. Notification of deviations from Contract Documents.
 6. Submittal Log Number conforming to Specification Section Numbers.
- G. The CONTRACTOR shall submit five (5) copies of descriptive or product data submittals/drawings to the ENGINEER. The ENGINEER will review the submittals/drawings and return to the CONTRACTOR the sets of marked-up submittals/drawings with appropriate review comments. All shop drawings, when practical, shall be 24 inch by 36 inch (24" x 36") in size.
- H. Once submittals/drawings are approved, they are to be distributed as follows:
1. OWNER: One (1) copy.
 2. ENGINEER: Two (2) copies.
 3. CONTRACTOR: Two (2) copies.
- I. The CONTRACTOR shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by ENGINEER of the necessary shop drawings.
- J. The CONTRACTOR shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposed to supply both as pertaining to his own work and any work affected under other parts, headings, or divisions of Drawings and Specifications.

1.03. ENGINEER'S REVIEW OF SHOP DRAWINGS

- A. The ENGINEER's review of drawings, data and samples submitted by the CONTRACTOR will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The ENGINEER's review and exceptions, if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.
- B. The review of drawings and schedules will be general, and shall not be construed:
 - 1. As permitting any departure from the Contract requirements;
 - 2. As relieving the CONTRACTOR of responsibility of any errors, including details, dimensions, and materials;
 - 3. As approving departures from details furnished by the ENGINEER, except as otherwise provided herein.
- C. If the drawings or schedules as submitted describe variations and show a departure from the Contract requirements which ENGINEER finds to be in the interest of the OWNER and to be so minor as not to involve a change in Contract Price or time for performance, the ENGINEER may return the reviewed drawings, without noting an exception.
- D. When reviewed by the ENGINEER, each of the Shop Drawings will be identified as having received such review, being so stamped and dated. Shop Drawings stamped "NOT APPROVED/RESUBMIT" and with required corrections shown will be returned to the CONTRACTOR for correction and re-submittal.
- E. Re submittals will be handled in the same manner as first submittals. On Re submittals the CONTRACTOR shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the ENGINEER on previous submissions. The CONTRACTOR shall make any corrections required by the ENGINEER.
- F. If the CONTRACTOR considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the CONTRACTOR shall give written notice thereof to the ENGINEER.
- G. Shop drawings and submittal data shall be reviewed by the ENGINEER for each original submittal and first Re submittal; thereafter review time for subsequent Re submittals shall be charged to the CONTRACTOR in accordance with the terms of the ENGINEER's Agreement with the OWNER.
- H. When the Shop Drawings have been completed to the satisfaction of the

ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.

- I. No partial submittals will be reviewed. Submittals not complete will be returned to the CONTRACTOR for Re submittal. Unless otherwise specifically permitted by the ENGINEER, make all submittals in groups containing all associated items for:
 - 1. Systems.
 - 2. Processes.
 - 3. As indicated in Specifications Sections. All drawings, schematics, manufacturer's product data, certifications and other shop drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.

1.04 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "shop drawings" shall be considered to mean CONTRACTOR's plans for materials and equipment which become an integral part of the Project. These drawings shall be completed and detailed. Shop drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawing, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive to required shop drawings as defined above. As used herein, the term "manufactured" applied to standard units usually mass-produced; and "fabricate" means items specifically assembled or made out of selected materials to meet individual design requirements.
- B. Manufacturer's catalog sheets, brochures, diagrams, illustrations, and other standard descriptive data shall be clearly marked to identify pertinent materials, product, or models. Delete information which is not applicable to the Work by striking or cross-hatching.
- C. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the ENGINEER and shall bear the CONTRACTOR's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the CONTRACTOR for resubmission.
- D. Each shop drawing shall have a blank area three and one-half inch x three and one-half inch (3-1/2" x 3-1/2"), located adjacent to the title block. The title block shall display the following:

1. Project title and number.
 2. Name of project building or structure.
 3. Number and title of the shop drawing.
 4. Date of shop drawing or revision.
 5. Name of CONTRACTOR and subcontractor submitting drawing.
 6. Supplier/manufacturer.
 7. Separate detailer when pertinent.
 8. Specification title and number.
 9. Specification section.
 10. Drawing number.
- E. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the CONTRACTOR shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the CONTRACTOR fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.
- F. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish, and all other pertinent data.
- G. For all mechanical and electrical equipment furnished, the CONTRACTOR shall provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.
- H. All manufacturers or equipment suppliers who are proposed to furnish equipment or products shall submit an installation list to the ENGINEER along with the required shop drawings. The installation list shall include at least five (5) installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.
- I. Only the ENGINEER will utilize the color "red" in marking shop drawing submittals.

1.05 WORKING DRAWINGS

- A. When used in the Contract Documents, the term “working drawings” shall be considered to mean the CONTRACTOR’s plan for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and false work; for underpinning; and for such other work as may be required for construction but does not become an integral part of the project.
- B. Copies of working drawings as noted in paragraph 1.05 A. above, shall be submitted to the ENGINEER where required by the Contract Documents or requested by the ENGINEER, and shall be submitted at least 30 calendar days (unless otherwise specified by the ENGINEER) in advance of their being required for work.
- C. Working drawings shall be signed by a registered Professional Engineer, currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Review of working drawings by the ENGINEER will not relieve the CONTRACTOR in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the CONTRACTOR; the OWNER and ENGINEER shall have no responsibility therefore.

1.06 SAMPLES

- A. The CONTRACTOR shall furnish, for the approval of the ENGINEER, samples required by the Contract Documents or requested by the ENGINEER. Samples shall be delivered to the ENGINEER as specified or directed. The CONTRACTOR shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the ENGINEER.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices.
 - 2. Full range of color, texture and pattern.
 - 3. A minimum of two (2) samples of each item shall be submitted.
- C. Each sample shall have a label indicating:
 - 1. Name of project.
 - 2. Name of CONTRACTOR and subcontractor.

3. Material or equipment represented.
4. Place of origin.
5. Name of producer and brand (if any).
6. Location in project.
7. Submittal Number.

(Samples of finished materials shall have additional marking that will identify them under the finish schedules).

- D. The CONTRACTOR shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in paragraph 1.06 B. above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the ENGINEER. Approval of a sample shall be only for the characteristics or use names in such approval and shall not be construed to change or modify any Contract requirements.
- E. Approved samples not destroyed in testing shall be sent to the ENGINEER or stored at the site of work. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved will be returned to the CONTRACTOR at his expense, if so requested at time of submission.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 00

LOCATION, SCOPE AND SPECIAL REQUIREMENTS

PART 1 - GENERAL

- 1.01 The Contractor shall not have any right in property in any materials taken from any excavation and he shall not remove any earth, sand or other material from the lines of the work before the excavation is refilled except upon direction of the Engineer. The provisions of this paragraph shall not be construed as relieving the Contractor of any kind of his obligations to remove and dispose of any of the material excavated, with or without rehandling, at his cost and expense as provided in these specifications.
- 1.02 Where reference is made within these documents to government specifications, or those of well known organizations such as ASTM, ASA, ASME, etc., the latest editions shall be used, any or all references in these documents to earlier stated editions notwithstanding.
- 1.03 The Contractor shall take all necessary precautions to prevent damage to existing pipe which is to remain in service during any of his construction operations. Should such pipe be damaged by the Contractor, he shall be required to replace it to the complete satisfaction of the Engineer, at no additional cost to the Owner.
- 1.04 The Contractor agrees that the work shall be started no later than the date indicated in the Notice to Proceed, and that the total work shall be completed within **180** calendar days.

The Contractor further agrees that for each calendar day, with the exception of Sundays and legal holidays, that any such work shall remain uncompleted after the completion time, the sum of **One Thousand Dollars (\$1000)** per day shall be deducted by the Owner from monies due the Contractor, not as a penalty but as liquidated damages. If the Contractor is declared in default in accordance with the provisions of the specifications, liquidated damages shall be charged as provided herein, and such amounts shall be deducted from the final amount payable to the Contractor or his Surety. Should the total amount chargeable as liquidated damages exceed the amount due or payable to the Contractor or his Surety, then such excess shall be paid to the Owner by the Contractor or his Surety.

- 1.05 At least thirty (30) days prior to the first progress payment request, the Contractor shall submit to the Owner a schedule of anticipated draws, which estimates as accurately as possible the amount of the anticipated "work in place" which will be completed each month. Failure to comply may result in delay in payment, as funds from several sources customarily serve as the project funding source.
- 1.06 All dewatering and bypass pumping necessary to accomplish the work of this Contract shall be done by the Contractor at no extra or additional cost to the Owner. Any permits required will be the responsibility of the Contractor.

- 1.07 Examination of Contract Documents and Site. Before submitting a Bid each Contractor must (a) examine the Contract Documents thoroughly, (b) visit the site to familiarize himself with local conditions that may in any manner affect cost, progress or performance of the work, (c) familiarize himself with federal, state and local laws, ordinance, rules and regulations that may in any manner affect cost, progress or performance of the work, and (d) study and carefully correlate Bidder's observations with the Contract Documents.
- 1.08 The Contractor is required to maintain the water service to customers within the project area at no extra cost to the Owner.
- 1.09 The Contractor is responsible for recording the Payment and Performance Bond and the Public Construction Bond in the Official Records of Volusia County, Florida. The Contractor shall provide copies of the recorded documents and/or the recording receipt from the County Clerk's office to the Engineer prior to the issuance of the "Notice to Proceed". The Contractor shall be responsible for paying all costs associated with the recording of these documents and no separate contract payment shall be made to the Contractor for this item.
- 1.10 The Contractor acknowledges that he is responsible for complying with all aspects of the Florida Trench Safety Act (90-96, Laws of Fla.) effective October 1, 1990. He assumes all responsibility and costs entailed.
- 1.11 Construction materials may be stockpiled at the Holly Hill wastewater treatment plant. Additional storage locations are allowed but all arrangements and costs incurred are the responsibility of the Contractor. Prior to making arrangements with individual property owners, the Contractor shall indicate to the City and the Engineer which sites have been targeted for material storage. The City reserves the right to approve or disapprove the proposed locations.
- 1.12 The Contractor is responsible for obtaining a St. Johns River Water Management District Permit for (dewatering) consumptive use if the Contractor's "means or methods" trip the Agency's thresholds requiring permits. No separate payment or contract time extension for the Contractor obtaining the permit will be granted by the City.
- 1.13 The Contractor shall submit an executed "Consent of Surety for Final Payment" form, copy of which is included with the Contract Documents, prior to submitting a final request for payment as well as lien releases from all suppliers filing 'Notice to Owners' with the City.
- 1.14 The Contractor is advised that all bypass pumping shall be coordinated with the Public Works Department. All pumping equipment, piping, operation and clean up is the sole responsibility of the Contractor.
- 1.15 All unit pricing shall remain valid for the duration of the contract.
- 1.16 Florida Sales Tax on materials, as well as all other customary taxes on construction activities, shall be paid for by the Contractor at no additional expense to the Owner.

- 1.17 All service outages shall be coordinated through the Public Works Department. Provisions shall be made for extended outages provisions may include temporary piping and services or alternative means of maintaining potable water service for affected residents. It is the Contractor's responsibility to notify the homeowner's of any potential impacts resulting from construction activities. The contractor shall document all notification procedures and provide written notification to the residents which specifically describe time frames for scheduled outages. Any claims for damages resulting from construction activities are the sole responsibility of the contractor.
- 1.18 The Contractor will set up an account and pay for all water used in the construction of the proposed improvements.
- 1.19 Construction shall be limited to weekday 'day light' working hours. No weekend, night time or holiday work shall be performed without obtaining permission in advance from the Project Engineer.
- 1.20 The Contractor must submit a work plan and traffic control plan in writing prior to commencement of work. The plan is subject to the approval of the fire department, police department, public works department and the Engineer.
- 1.21 The Contractor shall schedule his work in a manner that will result in a continuous process from commencement through completion. The intention of this requirement is to complete an area once work has commenced and avoid skipping from one site to another and disrupting several areas of the City simultaneously.
- 1.22 The Contractor must maintain access to driveways while construction is in progress.
- 1.23 This work may have an impact upon system customers. The Contractor shall have someone on call to take emergency calls on a 24 hour per day seven day per week basis. This individual will be able to respond to emergency calls from City personnel.

END OF SECTION

SECTION 01 35 01

ATTACHMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The following attachments are hereby made part of the project specifications as fully and completely as if the same were fully set forth herein:

1. CDBG Documents
2. FDEP Environmental Resource Permit

SUPPLEMENTAL CONDITIONS FOR FEDERALLY ASSISTED PROJECTS

The supplemental conditions contained in this section are intended to cooperate with, to supplement, and to modify the general conditions and other specifications. In case of disagreement with any other section of this contract, the Supplemental Conditions shall govern. This contract is funded in whole or in part with federal funds made available from the U.S. Department of Housing and Urban Development (HUD). The contractor and all of its subcontractors shall comply with these federal provisions. The contractor shall include these supplemental conditions in all subcontracts.

1. Davis-Bacon Act
2. Copeland "Anti-Kick Back" Act
3. Federal Labor Standards
4. Environmental Compliance
5. Lead Based Paint Requirements
6. Historic Preservation
7. Energy Efficiency
8. Flood Disaster Protection
9. Special Equal Opportunity Provisions
10. Section 3
11. Conflict of Interest
12. Utilization of Minority and Women-owned Businesses
13. Fair Housing Laws
14. Drug Free Workplace
15. Debarred Contractors
16. Lobbying
17. Access to Records
18. Records Retention

Attachment I - Federal Labor Standards Provisions

Attachment II - Section 3 Clause

1. Davis- Bacon Act- 29 CFR Parts 1,3,5,6 and 7

The contractor agrees to comply with the requirements of the Davis-Bacon Act, which requires the payment of prevailing wage rates (which are determined by the U.S. Department of Labor) to all laborers and mechanics on federally funded construction projects in excess of \$2,000. A Davis-Bacon wage decision (or wage determination) is a listing of various construction work classifications and the minimum wage rates (and fringe benefits, where prevailing) that workers who perform work in those classifications must be paid.

2. Copeland "Anti-Kickback" Act- 18 USC 874 and 40 USC 276c; 29 CFR Part 3

The contractor and subcontractor(s) shall comply with the requirements of the Copeland "Anti-Kickback" Act as supplemented in the U.S. Department of Labor regulations 29 CFR Part 3. The Copeland Act makes it a federal crime for anyone to require any laborer or mechanic (employed on a federally assisted project) to kickback (i.e. give up or pay back) any part of their wages. The Copeland Act requires every contractor and subcontractor to submit weekly payroll reports (certified payroll) and regulates permissible payroll deductions.

3. Federal Labor Standards

The project or program to which the construction work covered by this contract pertains is a federally assisted project and the Federal Labor Standards Provisions are included in this contract pursuant to the provisions applicable to such Federal assistance. See Attachment 1 for a complete copy of these labor standards.

4. Environmental Compliance- Section 306 of the Clean Air Act, Section 508 of the Clean Water Act and EPA Regulations- 42 U.S.C. 1857(h)

The contractor shall comply with the requirements of the Federal Clean Air Act and the Federal Water Pollution Control Act, as amended. Requirements for compliance with these regulations apply to contracts and subcontracts in amounts in excess of \$100,000. all applicable standards, orders, or requirements issued under (), (33 U.S.C. 1368), Executive Order 11738, and U.S. Environmental Protection Agency regulations (40 C.F.R. Part 15).

5. Lead- Based Paint Requirements- 24 CFR Part 35

All housing that is assisted by the contractor through this project with federal funds is subject to the lead-based paint requirements, found at 24 CFR Part 35. These rules apply to properties that were constructed prior to 1978, and require:

- Certain disclosures (in the form of notices) to occupants and applicants about any known or potential lead-based paint hazards
- Testing, assessing, and stabilization or reduction of lead-based paint hazards in accordance with established procedures, based on activity type and level of Federal assistance (for rehabilitation)
- Use of safe work practices
- Certain provisions included in all contracts and subcontracts related to lead-based paint
- Ongoing maintenance to monitor controls put in place to limit the hazards associated with the presence of lead-based paint.

6. Historic Preservation- 16 USC 470; 36 CFR Part 800

The contractor's performance may be subject to the Historic Preservation requirements set forth in the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470) and the procedures set forth in 36 CFR Part 800, Advisory Council on Historic Preservation Procedures for Protection of Historic Properties.

7. Energy Efficiency

The contractor shall comply with any mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

8. Flood Disaster Protection- 42 USC 4001

The contractor's performance may be subject to the Flood Disaster Protection Act of 1973 which requires that activities located in an area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards, flood insurance under the National Flood Insurance Program must be obtained and maintained as a condition of financial assistance for acquisition or construction purposes (including housing rehabilitation.)

9. Special Equal Opportunity Provisions

A. Activities and Contracts Not Subject to Executive Order 11246, as Amended

(Applicable to Federally assisted construction contracts and related subcontracts \$10,000 and under.)

During the performance of this contract, the Contractor agrees as follows:

- i. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.
- ii. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by Contracting Officer seeking forth the provisions of this nondiscrimination clause. The Contractor shall state that all qualified applicants be considered without regard to race, color, religion, sex or national origin.
- iii. Contractors shall incorporate foregoing requirements in all subcontracts.

B. Executive Order 11246 (contracts/subcontracts above \$10,000)

During the performance of this contract, the contractor agrees as follows:

- i. Section 202 Equal Opportunity Clause
 - a. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are

treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment, or recruitment advertising; layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in a conspicuous place, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

- b. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration without regard to race, color, religion, sex, or national origin.
- c. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided by the Contract Compliance Officer advising the said labor union or workers representatives of the Contractors commitment under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- d. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the Rules, Regulations, and Relevant Orders of the Secretary of Labor.
- e. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and others.

C. Certification of Non-segregated Facilities- E.O. 11246; 41 CFR Part 60-1.8

By the submission of this bid, the bidder, offeror, applicant or subcontractor certifies that he/she does not maintain or provide for his/her employees any segregated facility at any of his/her establishments, and that he/she does not permit employees to perform their services at any location, under his/her control, where segregated facilities are maintained. He/She certifies further that he/she will not maintain or provide for employees any segregated facilities at any of his/her establishments, and he/she will not permit employees to perform their services at any location under his/her control where segregated facilities are maintained. The bidder, offeror, applicant or subcontractor agrees that a breach of this certification is violation of the Equal Opportunity Clause of this contract. As used in this certification, the term segregated facilities means any waiting rooms, work eating areas, time clocks, locker rooms, and other storage or dressing areas, transportation and housing facilities provided for employees

which are in fact segregated on the basis of race, color, religion, or otherwise. He/She further agrees that (except where he/she has obtained identical certifications from proposed subcontractors prior to the award of subcontractors have submitted identical certifications for specific time periods).

D. Equal Employment Opportunity- Title VII of the Civil Rights Act of 1964 E.O. 11246

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

E. Americans with Disabilities Act of 1990- E.O. 11250; 42 U.S.C 12131; 24 CFR Part 35

The contractor shall not exclude on the basis of handicap persons from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

F. Section 109 of the Housing and Community Development Act of 1974

No person in the United States shall on the grounds of race, color, national original, or sex is excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

G. Section 504 of the Rehabilitation Act of 1973- 29 USC 794, 24 CFR Parts 8 and 9

- i. The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.
- ii. The Contractor agrees to comply with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
- iii. In the event of the Contractors noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- iv. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be

prescribed by the Director, provided by or through the contracting officer. Such notices shall state the Contractors obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.

- v. The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or their contract understanding, that the contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.
- vi. The Contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

H. Age Discrimination Act of 1975- 42 U.S.C. 6101, et seq; 24 CFR Part 146

The contractor shall comply with the Age Discrimination Act of 1975, which provides that no person, on the basis of age be excluded from participation in, be denied the benefits of, or be subjected to discrimination under, any program, or activity receiving Federal Financial assistance.

I. NSP 3 Vicinity Hiring and Contracting Preference-

A contractor that is awarded a project involving the use of NSP3 funds, as provided by the Dodd-Frank "Wall Street Reform and Consumer Protection Act" of January 5, 2010, sec 1497 (a)(8), is required to take actions to hire employees who reside in the vicinity of NSP3-funded projects, and provide contracting opportunities to small businesses that are owned and operated by residents in this vicinity.

10. Section 3- 24 CFR Part 135

The contractor shall comply with the purposes of the Section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701U) (Section 3) and ensure that employment and other economic opportunities generated by HUD funded programs, to the greatest extent feasible, and consistent with Federal, State, and local laws and regulations, be directed to low- and very-low income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low and very low-income persons. Section 3 regulations apply to all contractors and subcontractors awarded contracts for HUD assisted projects which are in excess of \$100,000. **Section 3 requires that the Section 3 Clause (See Attachment II) be included in every contract that involves section 3 projects.**

11. Conflict Of Interest- 24 CFR Part 85.36 and 24 CFR Part 570.611

No officer or employee of the local jurisdiction or its designees or agents, no member of the governing body, and no other public official of the locality who exercises any function or responsibility with respect to this contract, during his/her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed. Further, the Contractor shall cause to be incorporated in all subcontracts the language set forth in this paragraph prohibiting conflict of interest.

12. Utilization Of Minority And Women Firms (M/WBE)- 24 CFR Part 85 (e)

The contractor shall take affirmative steps to assure that M/WBE firms are utilized when possible as suppliers and/or subcontractors, as applicable.

Prior to contract award, the contractor shall document efforts to utilize M/WBE firms, including identifying what firms were solicited as suppliers and/or subcontractors, as applicable. Information regarding certified M/WBE firms can be obtained from:

- State of Florida at 904-487-4698 (all goods and services)
- State of Florida at 904-921-7370 (construction services, particularly highway)
- Minority Business Development Center in most major cities
- Local government M/WBE programs in many large counties and cities

13. Fair Housing Laws

The contractor shall comply with the Fair Housing Act, and related laws that prohibit discrimination on the basis of race, color, national origin, religion, sex, familial status and handicap in the provision of housing, including rental, purchase, advertising, financing, insurance and multi-family housing on the basis of race, color, national origin, religion, sex, familial status and handicap. The requirements of the Fair Housing Act (42 U.S.C. 3601-20) and implementing regulations at 24 CFR part 100; Executive Order 11063, as amended by Executive Order 12259 (3 CFR, 1958-1063 Comp., p. 652 and 3 CFR, 1980 Comp., p. 307) (Equal Opportunity in Housing) and implementing regulations at 24 CFR part 107; and title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d) (Nondiscrimination in Federally Assisted Programs) and implementing regulations issued at 24 CFR part 1 shall apply to any housing related contract awarded hereunder.

14. Drug Free Workplace- 41 USC 701, 24 CFR Part 21

The Contractor shall comply with the requirements of the Drug-Free Workplace Act of 1988. The Contractor certifies to comply with the drug-free workplace requirements in accordance with the Act, and with U.S. Department of Housing and Urban Development regulations.

15. Debarred Contractors

This project is subject to requirements prohibiting use of federal funds to directly or indirectly employ, award contracts to, or otherwise engage the services of any contractor, subcontractor or subrecipient during any period of federal debarment, suspension, or placement of ineligibility status. The County is required to check the eligibility status of all contractors, subcontractors, and subrecipients against the federal publication that lists debarred and ineligible contractors. This list can be found on the The System for Award Management (SAM) at <https://www.sam.gov>

16. Lobbying

The Contractor certifies, to the best of his or her knowledge and belief, that:

- A.** No federally appropriated funds have been paid or will be paid, by or on behalf of the Contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal loan, the entering into of any cooperative agreement, or the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan or cooperative agreement.
- B.** If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- C.** The Contractor shall require that the language of this certification be included in the award documents for all sub-awards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements.
- D.** This certification is a material representation of fact upon which reliance was placed when this contract was made or entered into. Agreement to this certification is a prerequisite for making or entering into this contract imposed by Section 1352, title 31, U.S. Code. Any person or agency that makes an expenditure prohibited by this section is subject to a civil penalty from \$10,000 up to \$100,000 for each failure. This penalty also applies to any person or agency that fails to submit or amend the disclosure form (LLL), when required. Failure to submit the required certification may result in payment under this contract being delayed or denied.

17. Access to Records- 24 CFR Part 85.42 (e) & (f)

The contractor shall give access to all records, pertinent books, documents, papers or other records related to this contract to the awarding agency, the County of Volusia, the U.S. Department of Housing and Urban Development, the Comptroller General of the United States, and any of their duly authorized representatives for the purpose of making audit, examination, excerpts, and transcriptions as needed.

18. Records Retention- 24 CFR Part 85.42 (a)-(d)

The contractor shall comply with the CDBG records retention regulations. Financial, program, supporting, and other records pertinent to this contract and the grant program shall be maintained for five years after the local government makes final payment and all other pending matters are closed.

Federal Labor Standards Provisions

U.S. Department of Housing
and Urban Development
Office of Labor Relations**Applicability**

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination.

The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section I(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section I(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been

communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A. 3. (ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who

is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification.

If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be

awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration . . . makes, utters or publishes any statement knowing the same to be false . . . shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$25 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

Attachment II

Section 3 requires that the following provisions (“the section 3 clause”), be included in every contract that involves section 3 projects.

- A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- B. The parties to this contract agree to comply with HUD’s regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.
- C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers’ representative of the contractor’s commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontract is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.
- E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor’s obligations under 24 CFR part 135.
- F. Non-compliance with HUD’s regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contract and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

Wage and Hour Division (WHD)

Instructions For Completing Payroll Form, WH-347

- [WH-347](#) (PDF)
OMB Control No. 1235-0008, Expires 04/30/2021.

General: Form WH-347 has been made available for the convenience of contractors and subcontractors required by their Federal or Federally-aided construction-type contracts and subcontracts to submit weekly payrolls. Properly filled out, this form will satisfy the requirements of Regulations, Parts 3 and 5 (29 C.F.R., Subtitle A), as to payrolls submitted in connection with contracts subject to the Davis-Bacon and related Acts.

While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) requires contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) Regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Under the Davis-Bacon and related Acts, the contractor is required to pay not less than prevailing wage, including fringe benefits, as predetermined by the Department of Labor. The contractor's obligation to pay fringe benefits may be met either by payment of the fringe benefits to bona fide benefit plans, funds or programs or by making payments to the covered workers (laborers and mechanics) as cash in lieu of fringe benefits.

This payroll provides for the contractor to show on the face of the payroll all monies to each worker, whether as basic rates or as cash in lieu of fringe benefits, and provides for the contractor's representation in the statement of compliance on the payroll (as shown on page 2) that he/she is paying for fringe benefits required by the contract and not paid as cash in lieu of fringe benefits. Detailed instructions concerning the preparation of the payroll follow:

Contractor or Subcontractor: Fill in your firm's name and check appropriate box.

Address: Fill in your firm's address.

Payroll No.: Beginning with the number "1", list the payroll number for the submission.

For Week Ending: List the workweek ending date.

Project and Location: Self-explanatory.

Project or Contract No.: Self-explanatory.

Column 1 - Name and Individual Identifying Number of Worker: Enter each worker's full name and an individual identifying number (e.g., last four digits of worker's social security number) on each weekly payroll submitted.

Column 2 - No. of Withholding Exemptions: This column is merely inserted for the employer's convenience and is not a requirement of Regulations, Part 3 and 5.

Column 3 - Work Classifications: List classification descriptive of work actually performed by each laborer or mechanic. Consult classification and minimum wage schedule set forth in contract specifications. If additional classifications are deemed necessary, see Contracting Officer or Agency representative. An individual may be shown as having worked in more than one classification provided an accurate breakdown of hours worked in each classification is maintained and shown on the submitted payroll by use of separate entries.

Column 4 - Hours worked: List the day and date and straight time and overtime hours worked in the applicable boxes. On all contracts subject to the Contract Work Hours Standard Act, enter hours worked in excess of 40 hours a week as "overtime".

Column 5 - Total: Self-explanatory

Column 6 - Rate of Pay (Including Fringe Benefits): In the "straight time" box for each worker, list the actual hourly rate paid for straight time worked, plus cash paid in lieu of fringe benefits paid. When recording the straight time hourly rate, any cash paid in lieu of fringe benefits may be shown separately from the basic rate. For example, "\$12.25/.40" would reflect a \$12.25 base hourly rate plus \$0.40 for fringe benefits. This is of assistance in correctly computing overtime. See "Fringe Benefits" below. When overtime is worked, show the overtime hourly rate paid plus any cash in lieu of fringe benefits paid in the "overtime" box for each worker; otherwise, you may skip this box. See "Fringe Benefits" below. Payment of not less than time and one-half the basic or regular rate paid is required for overtime under the Contract Work Hours Standard Act of 1962 if the prime contract exceeds \$100,000. In addition to paying no less than the predetermined rate for the classification which an individual works, the contractor must pay amounts predetermined as fringe benefits in the wage decision made part of the contract to approved fringe benefit plans, funds or programs or shall pay as cash in lieu of fringe benefits. See "FRINGE BENEFITS" below.

Column 7 - Gross Amount Earned: Enter gross amount earned on this project. If part of a worker's weekly wage was earned on projects other than the project described on this payroll, enter in column 7 first the amount earned on the Federal or Federally assisted project and then the gross amount earned during the week on all projects, thus "\$163.00/\$420.00" would reflect the earnings of a worker who earned \$163.00 on a Federally assisted construction project during a week in which \$420.00 was earned on all work.

Column 8 - Deductions: Five columns are provided for showing deductions made. If more than five deduction are involved, use the first four columns and show the balance deductions under "Other" column; show actual total under "Total Deductions" column; and in the attachment to the payroll describe the deduction(s) contained in the "Other" column. All deductions must be in accordance with the provisions of the Copeland Act Regulations, 29 C.F.R., Part 3. If an individual worked on other jobs in addition to this project, show actual deductions from his/her weekly gross wage, and indicate that deductions are based on his gross wages.

Column 9 - Net Wages Paid for Week: Self-explanatory.

Totals - Space has been left at the bottom of the columns so that totals may be shown if the contractor so desires.

Statement Required by Regulations, Parts 3 and 5: While the "statement of compliance" need not be notarized, the statement (on page 2 of the payroll form) is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing this statement should have knowledge of the facts represented as true.

Items 1and 2: Space has been provided between items (1) and (2) of the statement for describing any deductions made. If all deductions made are adequately described in the "Deductions" column above, state

"See Deductions column in this payroll." See "FRINGE BENEFITS" below for instructions concerning filling out paragraph 4 of the statement.

Item 4 FRINGE BENEFITS - Contractors who pay all required fringe benefits: If paying all fringe benefits to approved plans, funds, or programs in amounts not less than were determined in the applicable wage decision of the Secretary of Labor, show the basic cash hourly rate and overtime rate paid to each worker on the face of the payroll and check paragraph 4(a) of the statement on page 2 of the WH-347 payroll form to indicate the payment. Note any exceptions in section 4(c).

Contractors who pay no fringe benefits: If not paying all fringe benefits to approved plans, funds, or programs in amounts of at least those that were determined in the applicable wage decision of the Secretary of Labor, pay any remaining fringe benefit amount to each laborer and mechanic and insert in the "straight time" of the "Rate of Pay" column of the payroll an amount not less than the predetermined rate for each classification plus the amount of fringe benefits determined for each classification in the application wage decision. Inasmuch as it is not necessary to pay time and a half on cash paid in lieu of fringe benefits, the overtime rate shall be not less than the sum of the basic predetermined rate, plus the half time premium on basic or regular rate, plus the required cash in lieu of fringe benefits at the straight time rate. In addition, check paragraph 4(b) of the statement on page 2 the payroll form to indicate the payment of fringe benefits in cash directly to the workers. Note any exceptions in section 4(c).

Use of Section 4(c), Exceptions

Any contractor who is making payment to approved plans, funds, or programs in amounts less than the wage determination requires is obliged to pay the deficiency directly to the covered worker as cash in lieu of fringe benefits. Enter any exceptions to section 4(a) or 4(b) in section 4(c). Enter in the Exception column the craft, and enter in the Explanation column the hourly amount paid each worker as cash in lieu of fringe benefits and the hourly amount paid to plans, funds, or programs as fringe benefits. The contractor must pay an amount not less than the predetermined rate plus cash in lieu of fringe benefits as shown in section 4(c) to each such individual for all hours worked (unless otherwise provided by applicable wage determination) on the Federal or Federally assisted project. Enter the rate paid and amount of cash paid in lieu of fringe benefits per hour in column 6 on the payroll. See paragraph on "Contractors who pay no fringe benefits" for computation of overtime rate.

Public Burden Statement: We estimate that it will take an average of 55 minutes to complete this collection of information, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection of information, including suggestions for reducing this burden, send to the Administrator, Wage and Hour Division, ESA, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W., Washington, D.C. 20210.

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.



Rev. Dec. 2008

OMB No.:1235-0000
Expires: 04/30/2010

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐						ADDRESS								OMB No.: 1235-00 Expires: 04/30/20			
PAYROLL NO.			FOR WEEK ENDING			PROJECT AND LOCATION							PROJECT OR CONTRACT NO.				
(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	(4) DAY AND DATE OT, OR ST. HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS						(9) NET WAGE PAID FOR WE				
							FICA	WITH- HOLDING TAX			OTHER	TOTAL DEDUCTIONS					
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room 3502, 200 Constitution Avenue, N.W., Washington, D.C. 20210

(over)

Packet Pg. 267

Attachment: HH Lift Station #9 Replacement_Bid Set Specifications_02.21.20 (2020-R-21 : Lift Station #9)

Packet Pg. 268

"General Decision Number: FL20200137 01/03/2020

Superseded General Decision Number: FL20190137

State: Florida

Construction Type: Heavy

County: Volusia County in Florida.

HEAVY CONSTRUCTION PROJECTS (Including Sewer and Water Lines)
(EXCLUDING CAPE CANAVERAL AIR FORCE STATION, PATRICK AIR FORCE
BASE, KENNEDY SPACE FLIGHT CENTER AND MALABAR RADAR SITE)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts,

including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date
 0 01/03/2020

ENGI0673-013 05/01/2013

	Rates	Fringes
OPERATOR: Oiler.....	\$ 20.36	10.85

* IRON0808-003 01/01/2019

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 27.28	14.70

LAB00517-002 05/01/2017

	Rates	Fringes
LABORER: Grade Checker.....	\$ 19.20	7.85

PAIN1010-011 08/01/2019

	Rates	Fringes
Painter - Brush, Roller & Spray.....	\$ 24.71	13.50

SUFL2009-176 06/24/2009

	Rates	Fringes
CARPENTER, Excludes Form Work....	\$ 13.56	1.84
CEMENT MASON/CONCRETE FINISHER...	\$ 12.63	0.00

ELECTRICIAN.....	\$ 16.71	3.51
FORM WORKER.....	\$ 11.36	0.00
LABORER: Common or General.....	\$ 9.03	0.81
LABORER: Landscape.....	\$ 8.44	0.00
LABORER: Pipelayer.....	\$ 11.17	1.27
LABORER: Power Tool Operator (Hand Held Drills/Saws, Jackhammer and Power Saws Only).....	\$ 10.63	2.20
OPERATOR: Asphalt Paver.....	\$ 11.88	0.00
OPERATOR: Backhoe Loader Combo.....	\$ 16.10	2.44
OPERATOR: Backhoe/Excavator.....	\$ 13.12	2.58
OPERATOR: Bulldozer.....	\$ 12.88	0.00
OPERATOR: Crane.....	\$ 14.88	3.17
OPERATOR: Grader/Blade.....	\$ 16.00	2.84
OPERATOR: Loader.....	\$ 13.38	0.00
OPERATOR: Mechanic.....	\$ 13.83	2.19
OPERATOR: Roller.....	\$ 10.50	0.00
OPERATOR: Scraper.....	\$ 11.00	1.74
OPERATOR: Trackhoe.....	\$ 20.92	5.50
OPERATOR: Tractor.....	\$ 10.00	0.00

TRUCK DRIVER, Includes Dump

Truck.....	\$ 11.07	0.00
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TRUCK DRIVER: Lowboy Truck.....	\$ 11.00	0.00
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TRUCK DRIVER: Off the Road

Truck.....	\$ 12.21	1.97
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WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which

these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests

for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

"



County of Volusia
Community Assistance
110 W. Rich Avenue
DeLand, FL 32720

Minority & Women Business Reporting Form (MWBE) Information and Instructions for Contractors & Subcontractors

Reporting

This report shall be completed by all contractors and subcontractors for reporting contract and subcontract activities for housing rehabilitation and construction projects as required by the County of Volusia Community Assistance Division. Contract/subcontracts of less than \$10,000 must be reported only if such contracts represent a significant portion of the total contracting activity. Include only the contracts executed during this reporting period.

- Section 7a:
 - ✓ **Amount of Contract/Subcontract:** Enter the dollar amount rounded to the nearest dollar. If subcontractor ID number is provided in 7f, the dollar figure would be for the subcontract only and not for the prime contract.
- Section 7b:
 - ✓ **Type of Trade:** Enter the numeric code which best indicates each contractor's/subcontractor's service type. If subcontractor ID number is provided in 7f, the type of trade code would be for the subcontractor only and not for the prime contractor.
 - * The "other" category includes supply, professional services, and all other activities except construction and education/training activities
- Section 7c:
 - ✓ **Business Racial/Ethnic/Gender Code:** Enter the numeric code which best indicates the racial/ethnic/gender character of the owner(s) and controller(s) of 51% of the business. When 51% or more is not owned and controlled by any single racial/ethnic/gender category, enter the code which seems most appropriate. If the subcontractor ID number is provided, the code would apply to the subcontractor and not the prime contractor
- Section 7d:
 - ✓ **Women Owned Business:** Enter "yes" or "no" to if each listed agency is women owned
- Section 7e:
 - ✓ **Contractor Identification Number:** Enter the Employer (IRS/FEIN) Number of the Prime Contractor as the unique identifier of the prime recipient of HUD funds. Note that the Employer (IRS) Number must be provided for each contract/subcontract awarded.
- Section 7f:
 - ✓ **Subcontractor Identification Number:** Enter the Employer (IRS/FEIN) Number of the subcontractor as the unique identifier for each subcontract awarded from HUD funds. When the subcontractor ID number is provided, the respective Prime Contractor ID Number must also be provided.
- Section 7g:
 - ✓ **Contractor/Subcontractor Business Name and Address:** Enter this information for each firm receiving contract/subcontract activity only one time on each report for each firm.

County of Volusia Community Assistance Division - Contract and Subcontract - Minority and Women Business Reporting Form

To be completed by Volusia County Staff: Project Name: _____ Date of Award: _____

Amount of Contract or Subcontract 7a.	Type of Trade Code (See below) 7b.	Contractor or Subcontractor Business Racial/Ethnic (See below) 7c.	Woman Owned Business (Yes or No) 7d.	Prime Contractor Identification Number (IRS/FEIN) 7e.	Subcontractor Identification Number (IRS/FEIN) 7f.	Contractor/Subcontractor Business Name and Address 7g.				
						Business Name	Street	City	State	Zip

Name/Title: _____

Signature: _____

Date: _____

7b: Type of Trade Codes:
CPD

- 1 = New Construction
2 = Education/Training
3 = Other

7c: Racial/
Ethnic Codes

- 1= White Americans
2= Black Americans
3= Native Americans
4= Hispanic American
5= Asian/Pacific American



Section 3 Information and Instructions

What is Section 3?

Section 3 is a provision of the Housing and Urban Development Act of 1968. The purpose of Section 3 is to ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, be directed to low- and very low income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low- and very low-income persons.

What does Section 3 require contractors and subcontractors to do?

- Provide employment and training opportunities to Section 3 residents by meeting the percentage goals in 24 CFR 135.30(b)(3)
- Provide subcontracting opportunities to Section 3 businesses by meeting the percentage goals in 24 CFR 135.30(c)

In addition, all contracts with contractors and subcontractors for Section 3 covered projects must contain the Section 3 contract clause in the contracts of its contractors and subcontractors. The HUD mandated Section 3 language ("Section 3 Clause") may be found at 24 CFR §135.38. The Section 3 Clause may also be found within the Supplemental Conditions which are included in the bid documents. All contracts for U.S. Department of Housing and Urban Development funded projects will contain the Section 3 contract clause.

Volusia County Community Assistance encourages all contractors and subcontractors to extend employment and training opportunities to Section 3 residents for any new opportunities which have been created as a result of the contract award. Reporting on Section 3 opportunities is required for all contractors and subcontractors that are awarded contracts for U.S. Department of Housing and Urban Development funded projects.

What is a Section 3 Resident?

A Section 3 Resident is 1) a public housing resident, or 2) a low- or very low-income person residing in the metropolitan area or non-metropolitan county where the Section 3 covered project is expended.

What is a Section 3 business?

A Section 3 business is defined as one:

- That is 51 percent or more owned by Section 3 residents; or
- Whose permanent, full-time employees include persons, at least 30 percent of whom are currently Section 3 residents, or within three years of the date of their first employment with the business were Section 3 residents; or
- That provides evidence of a commitment to subcontract in excess of 25 percent of the dollar award of all subcontracts to be awarded by the business to other Section 3 businesses (see first two definitions above).

Reporting

With Bid or Quote (Solicitation documents)

- All contractors and subcontractors must submit the Section 3 Certification and Existing Workforce Form.
- The Section 3 Resident Self-Certification form must be provided for all applicable persons

Upon project completion

- All contractors and subcontractors must submit the Section 3 New Hire Certification.
- The Section 3 Resident Self-Certification form must be provided for all applicable persons



**County of Volusia
Community Assistance
110 W. Rich Avenue
DeLand, FL 32720**



Section 3 Certification and Existing Workforce

The purpose of Section 3 is to ensure that employment and other economic opportunities generated by certain federally assisted projects shall, to the greatest extent feasible, and consistent with existing Federal, State and County rules and regulations, be directed to low- and very low-income persons, particularly those receiving housing assistance and to businesses that provide economic opportunities to these persons.

Any bid/proposal response for certain federally assisted projects that do not include this completed document will be considered non-responsive and not eligible for award.

Project Name: _____
 Agency Name: _____
 Contact person: _____ Title: _____
 Address of business: _____
 Telephone number: _____ Fax number: _____
 E-mail address: _____
 Federal Employer Identification Number/SSN: _____

1. Type of business:

(Check one) ☐ Corporation ☐ Sole Proprietorship ☐ Partnership ☐ Joint Venture

2. Check where applicable and provide required documentation:

- ☐ The business is **NOT** claiming a Section 3 status.
- ☐ The business **IS** claiming a Section 3 status based on the following:
- ☐ 51% of the business is owned by Section 3 qualified resident(s); see attached Section 3 Resident form(s)
 - ☐ 30% or more of current full-time workforce qualify as section 3 residents, or did within three years of their first date of employment with the business; see attached Section 3 Resident form(s) and list of all employees
 - ☐ More than 25% of the dollar award will be awarded to other qualified Section 3 businesses; see attached list of sub-contractors

3. Existing Workforce:

Attach to this form a list of existing agency employees that may work on this project. Please indicate which method of submittal is being used: ☐ Agency made employee list (or) ☐ "Existing Workforce List"

Regardless of the method, the submitted list must include the following information:

Employee Name
 Employee Identification Number
 Employee Wage Classification Type (title best suited to position from applicable wage determination)
 Employee Phone Number
 Employee Mailing Address; including city, state and zip code
 Employee Section 3 status. (If claiming a Section 3 resident self-certification form is required)

I certify to the best of my knowledge that the information contained here within is true and correct.

Print name: _____

Signature: _____

Date: _____

Title: _____

NOTE: Volusia County shall maintain this form and supporting documentation a minimum of five years in the project files for review during monitoring. The contractor must retain a copy of the reports in their files for a minimum of five years after completion of the project.

Existing Workforce List

Project Name: _____

Agency Name: _____

The following is a list of existing agency employees that may work on this project. The list must include the following:

Employee Name

Employee Identification Number (e.g. last four digits of Social Security number)

Employee Wage Classification Type (title best suited to position from applicable wage determination)

Employee Phone Number

Employee Mailing Address; including city, state and zip code

Employee Section 3 status. (If claiming a Section 3 resident self-certification form is required)

Employee Name	ID #	Wage Classification	Phone Number	Mailing Address	Claimi Section status



**County of Volusia
Community Assistance
110 W. Rich Avenue
DeLand, FL 32720**



Section 3 Resident Self-Certification

The purpose of Section 3 is to ensure that employment and other economic opportunities generated by certain HUD funded projects shall, to the greatest extent feasible, and consistent with existing Federal, State and County rules and regulations, be directed to low- and very low-income persons, particularly those receiving housing assistance and to businesses that provide economic opportunities to these persons.

A Section 3 Resident seeking training and employment opportunities provided by this part shall certify, and submit evidence to the recipient contractor or subcontractor, if requested, that the person is a Section 3 Resident, as defined in Section 135.5.

I, _____, (Print Name) am a legal resident the United States and of Volusia County, Florida and meet the income eligibility and federal guidelines for a Section 3 Resident. I am self-certifying as a Section 3 Resident because of the following reason(s):

- ☐ I am a public housing resident leaseholder – Submit copy of lease
- ☐ I live in public housing but am not on the lease – Submit copy of lease
- ☐ I am a Section 8 voucher holder – Submit copy of voucher
- ☐ My household income does not exceed the income guidelines by family size as published at the bottom of this form – Submit copy of most recent tax return or evidence of participation in a public assistance program

NOTE: Documentation of Section 3 Resident status must be submitted with this form

Name _____ Telephone _____

Home Address _____ (will be verified)
(Must be Street Address - Not a P.O. Box Number)

Please check the income below that applies to your household:

FY 2019 Income Limits Summary		
Family Size	Low Income	Very-Low Income
1	☐ \$34,300	☐ \$21,450
2	☐ \$39,200	☐ \$24,500
3	☐ \$44,100	☐ \$27,550
4	☐ \$48,950	☐ \$30,600
5	☐ \$52,900	☐ \$33,050
6	☐ \$56,800	☐ \$35,500

I hereby certify that the information provided by me to be true and correct. If found to be inaccurate, I understand that I may be disqualified as an applicant and/or a certified Section 3 Resident which may be grounds for termination of training, employment, or contracts that resulted from this certification and could subject me to punishment under the law.

Print Name _____

Signature _____ Date _____



County of Volusia
Community Assistance
110 W. Rich Avenue
DeLand, FL 32720



7.1.a

Section 3 New Hire Certification

The purpose of Section 3 is to ensure that employment and other economic opportunities generated by certain HUD funded projects shall, to the greatest extent feasible, and consistent with existing Federal, State and County rules and regulations, be directed to low- and very low-income persons, particularly those receiving housing assistance and to businesses that provide economic opportunities to these persons.

All project contractors and subcontractors must complete this form upon project conclusion.

Project Name: _____
Agency Name: _____
Reporting Period: From: _____ To: _____
(Project start date) (Project completion date)

1. Have you hired any new employees who worked on the above mentioned project since the existing workforce list was submitted? ☐ Yes ☐ No

(Note: this includes new employees hired specifically for this project or otherwise)

2. New Hires:

Attach to this form a list of employees that have been hired and worked on this project since the existing workforce list was submitted. Please indicate which method of submittal is being used:

☐ Agency made employee list (or) ☐ "New Hire List"

Regardless of the method, the submitted list must include the following information:

Employee Name

Employee Identification Number (e.g. last four digits of Social Security number)

Employee Wage Classification Type (title best suited to position from applicable wage determination)

Employee Phone Number

Employee Mailing Address; including city, state and zip code

Employee Section 3 status (If claiming this status, a Section 3 resident self-certification form is also required)

3. Did you recruit employees for this project? ☐ Yes ☐ No

a. If yes, please check any of the following method(s) used to recruit new employees who live within Volusia County and meet the Section 3 criteria:

☐ Advertised to fill vacancies in a local newspaper

☐ Posted vacancies prominently at the job site

☐ Placed signs and/or posters announcing vacancies at the local public housing authorities in Volusia County

☐ Distributed employment flyers in various locations within Volusia County

☐ Posted employment flyers in various locations within Volusia County

☐ Kept a log of all applicants for every position created by this project

☐ Retained copies of employment applications completed by Section 3 residents

☐ Other – Please provide details: _____

I certify to the best of my knowledge that the information contained here within is true and correct.

Print name: _____

Signature: _____

Date: _____

Title: _____

NOTE: Volusia County shall maintain this form and supporting documentation a minimum of five years in the project files for review during monitoring. The contractor must retain a copy of the reports in their files for a minimum of five years after completion of the project.

New Hire List

Project Name: _____

Agency Name: _____

The following is a list of new agency employees that have worked on this project.

Employee Name

Employee Identification Number (e.g. last four digits of Social Security number)

Employee Wage Classification Type (title best suited to position from applicable wage determination)

Employee Phone Number

Employee Mailing Address; including city, state and zip code

Employee Section 3 status. (If claiming a Section 3 resident self-certification form is required)

Employee Name	ID #	Wage Classification	Phone Number	Mailing Address	Claiming Section 3 status? (yes or no)

24 CFR PART 85.36 Administrative Requirements for Grants and Cooperative Agreements to State, Local and Federally Recognized Indian Tribal Governments

<https://www.hud.gov/sites/documents/24CFR85-36PROC.PDF>

Compliance with the following bonding requirements is mandatory.

Proof of bonding will be verified prior to issuance of the notice to proceed.

(h) Bonding requirements.

For construction or facility improvement contracts or subcontracts exceeding the simplified acquisition threshold, the awarding agency may accept the bonding policy and requirements of the grantee or sub grantee provided the awarding agency has made a determination that the awarding agency's interest is adequately protected. If such a determination has not been made, the minimum requirements shall be as follows:

- (1) A bid guarantee from each bidder equivalent to five percent of the bid price. The bid guarantee shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.
- (2) A performance bond on the part of the contractor for 100 percent of the contract price. A performance bond is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.
- (3) A payment bond on the part of the contractor for 100 percent of the contract price. A payment bond is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.



FLORIDA DEPARTMENT OF Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

7.1.a

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

PERMITTEE:

City of Holly Hill
453 LPGa Boulevard
Holly Hill, FL 32117
Walt Smyser, Public Works Deputy
Director

Email: wsmyser@hollyhillfl.org

PERMIT NUMBER:

0384140-001-DWC/CG

ISSUE DATE:

February 18, 2020

EXPIRATION DATE:

February 17, 2025

COUNTY:

Volusia

PROJECT NAME:

Holly Hill Lift Station 9

CONNECTED TO:

Holly Hill WRF

FACILITY ID:

FL0027677

Dear Mr. Smyser:

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our office received the Notice on February 10, 2020. This project includes the construction of a lift station connecting to upstream and downstream existing facilities on same site.

This is to advise you that the Department does not object to your use of such General Permit.

Please note the attached requirements apply to your use of this General Permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

Sincerely,

Osama Mahmoud
Engineer
Permitting and Waste Cleanup Program

OHM/ohm

cc: Andrew Giannini, PE, Mead and Hunt, Andrew.giannini@meadhunt.com
Charles LeGros, DEP, Charles.LeGros@dep.state.fl.us
Osama Mahmoud, DEP, Osama.mahmoud@dep.state.fl.us
Reggie Phillips, DEP, reggie.phillips@floridadep.gov

Attachment: HH Lift Station #9 Replacement_Bid Set Specifications_02.21.20 (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at:
<http://www.dep.state.fl.us/legal/Rules/shared/62-4/62-4.pdf> [62-4.540]
2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]
3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]
5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Central District Office Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: <http://www.dep.state.fl.us/water/wastewater/dom/dw-forms.htm>. [62-604.700(2)]

Please submit the entire clearance document package in electronic format to DEP_CD@dep.state.fl.us, with a copy to Osama.mahmoud@dep.state.fl.us . If the file is very large, you may post it to the Wastewater Electronic Applications folder on the following ftp site at:

<ftp://ftp.dep.state.fl.us/pub/wastewater/>

After posting the document, send an e-mail to DEP_CD@dep.state.fl.us, with a copy to Osama.mahmoud@dep.state.fl.us , alerting us that it has been posted. Any submitted drawings (should be sized 11" x 17") and the engineer of record's signed seal and dates on the required document must be legible for acceptance.

For further clarification contact:
(Osama Mahmoud), (407) 897-4125
3319 Maguire Blvd, Suite 232
Orlando, Florida 32803-3767

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]
7. Abnormal events shall be reported to the Department's Central District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800)320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Central District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

SECTION 01 42 00

REFERENCES

PART 1 – GENERAL

1.01 GENERAL

- A. Applicable Publications. Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of or omission from said standards or requirements.
- B. Assignment of Specialists. In certain instances, specification test requires (or implies) that specific work is to be assigned to specialist or expert entities who must be engaged for the performance of the Work. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work. They are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of Work is recognized as “expert” for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the CONTRACTOR.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all Work specified herein shall conform to or exceed the requirements of such referenced documents which are not in conflict with the requirements of these Specifications or applicable codes.
- B. References herein to “Building Code” shall mean the latest edition of the Florida Building Code. The latest edition of the code as approved and used by the local agency as of the date of award as adopted by the agency having jurisdiction shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

- C. In case of conflict between codes, reference standards, Drawings, and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER for clarification and directions prior to ordering or providing any materials or labor. The CONTRACTOR shall bid the most stringent requirements.
- D. Applicable Standard Specifications. The CONTRACTOR shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 35

TESTING AND TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Contractor will employ, and pay for services of an independent testing laboratory to perform testing specifically indicated on the Contract Documents or specified in the Specifications herein and may at any other time elect to have materials and equipment tested for conformity with the Contract Documents.
2. Contractor shall cooperate with the laboratory to facilitate the execution of its required services.
3. Contractor shall provide engineer with all test results as indicated herein within five (5) days of receipt.

B. Related Requirements Described Elsewhere:

1. Testing laboratory inspection, sampling and testing is required for, but not limited to the following:
 - a. Trenching, Backfilling, and Compacting: See FDOT Standard Specifications for Road and Bridge Construction, latest edition.
 - b. Cast-in-Place Concrete: See FDOT Standard Specifications for Road and Bridge Construction, latest edition.

C. The following schedule defines the responsibility for various tests.

Test	Notes	Paid for By
Soil Compaction	Pipe Work: Every 300 feet (300') at each lift of compaction minimum. Beneath Structures: Each 500 SF lift of compaction minimum and each lift around structures.	Contractor
Pressure	As specified in Section 15 05 00A	Contractor
Bacteriological	As required by local and state agencies	Contractor
LBR	Each 1500 SF of pavement (minimum)	Contractor

Test	Notes	Paid for By
Concrete	Slump test each delivery and compressions test five (5) cylinders every 50 CY (minimum)	Contractor

- D. Additional Tests: The Contractor shall pay for first tests as specified herein. In the event that first test samples do not meet the applicable material specification, the Contractor shall take measures to conform the material and equipment to the Specifications. All subsequent tests shall be paid for by the Contractor.

1.02 LABORATORY TESTS

- A. The materials listed below shall require advance and periodic laboratory tests as indicated and shall be sampled in accordance with the methods of the ASTM and as directed by the Engineer. With the exception of concrete test cylinders and mixing water, duplicate advance samples of all materials requiring laboratory tests shall be submitted to the Engineer, one of which will be certified by the Engineer for submission to the testing laboratory and the other retained on the job site in suitable storage provided by the Contractor. Except as noted below, preliminary samples of materials for advance laboratory tests shall be submitted at least two (2) weeks prior to starting delivery of such materials to the site of the project. The testing laboratory shall furnish both the Engineer and the Contractor with two (2) copies of the reports showing the results of such tests, and the reports shall be considered as sufficient evidence of the acceptance or rejection of the quality of the materials tested. The specifications for, and the method of testing, will be found under the detailed specifications for the particular material involved. All samples shall be properly packed and clearly marked as to source and intended use.

MATERIALS	TEST FREQUENCY	SAMPLE SIZE	SHIPPING CONTAINER
Fine Aggregate	Advance, first shipment then each 100 tons	100 lbs.	Canvas Sack
Coarse Aggregate	Advance, first shipment then each 200 tons	Stone or Gravel 200 lbs.	Strong Sack
Concrete	Advance test using approved materials	Four (4) cylinders per mix, two (2) broken at seven (7) days, two (2) at 28 days	
Concrete (b) Air Entrainment	Advance test on trial mix air entraining agent is used. Test as		

	specified under Article 405 (e)		
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1.03 TESTS

- A. The materials listed below shall be tested at the shop or plant of, and by, the producer. Each manufacturer of such materials shall be fully equipped to carry out the tests herein designated. Upon demand of the Engineer, the manufacturer shall perform such additional number of tests as the Engineer may deem necessary to establish the quality of the material offered for use. The Engineer shall be furnished with the certified records of reports of the results of all tests, such reports of records to contain a sworn statement that the tests have been made as specified.

MATERIAL	TEST METHOD
Cement	ASTM C 114
Ductile Iron Pipe (Centrifugally Cast)	As required under ANSI A21.51-1176
Brick	ASTM C 32
Reinforcement	ASTM A 15 & A 305

1.04 FIELD TESTS

- A. All sewers, water lines, piping and equipment shall be tested in the field in the presence of the Engineer or his authorized assistant, in the manner prescribed in the sections of these specifications pertaining to such installations. The Engineer may also perform or have performed any other field tests necessary to determine compliance with the Contract requirements. The Contractor shall furnish all necessary labor, equipment, and materials for such tests and, with the exception of the Engineer's expenses, shall bear all the cost thereof.

1.05 PAVING TESTS

- A. The following tests will be made, unless otherwise stipulated by the Engineer, by a testing laboratory approved by the Engineer.

Material	Test or Test Method	Frequency
Subbase	1) AASHTO T-180 [Modified Proctor Minimum 98 percent (98%) Density]	Every 300 LF
	2) Limerock Bearing Ratio 40	Every 300 LF
Base	(Soil Cement)	
	(1) Mix Design 350 psi @ 28 days. Mix design required seven (7) days in advance.	Prior to Mixing Base
	(2) Optimum Moisture content and Maximum Density (AASHTO T-134)	Every 300 LF
	(3) LBR 100	Every 1500 SF
	(4) Depth [six inch (6") minimum]	Every 300 feet (300')
Paving	(1) Job Mix Formula. Required seven (7) days in advance and submit to Engineer	Each Job
	(2) Bitumen Content of Mix	Every 2500 SY or fraction thereof
	(3) In Place Density	Every 300 feet (300') (left, right & center)
	(4) Marshall Field Stability Index	Every 1500 SY or fraction thereof
	(5) Thickness Cores	Every 300 feet (300') (left, right & center)

1.06 BASIS OF PAYMENT

- A. All shop tests and mill inspection shall be included in the price of the manufactured article, and no separate or extra payment will be made for such tests and inspection.
- B. All laboratory and field tests will be paid for by the Contractor; he shall furnish all necessary labor, equipment, and materials for such tests and, with the exception of the Engineer's expenses, shall bear all the costs thereof.

1.07 LABORATORY DUTIES: LIMITATIONS OF AUTHORITY

- A. Cooperate with Engineer and Contractor; provide qualified personnel promptly on notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specific standards; ASTM, other recognized authorities, and as specified.
 - 2. Determine and report on compliance with requirements of Contract Documents.
- C. Promptly notify the Engineer and Contractor of material or operations which do not meet the specifications.
- D. Promptly submit five (5) copies of reports of inspections and tests to the Engineer including:
 - 1. Date issued.
 - 2. Project title and Engineer's job number.
 - 3. Testing Laboratory name and address.
 - 4. Name and signature of inspector.
 - 5. Date of inspection of inspector.
 - 6. Date of inspection or sampling.
 - 7. Date of test.
 - 8. Identification of product and Specification section.
 - 9. Location in project.
 - 10. Type of inspection or test.
 - 11. Compliance with Contract Documents or not.
- E. Laboratory is not authorized to:
 - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Approve or reject any portion of work.
 - 3. Perform any duties of the Contractor.

1.08 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel; provide access to Work and manufacture's operations.
- B. Secure and deliver to the laboratory adequate representational samples of materials purposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be for concrete, and other materials mixes which require control by the testing laboratory.
- D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacturer of fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Engineer may require the Contractor to provide statements or certificates from the manufacturers and fabricators that in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.
 - 5. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Work specified in this Section consists of designing, providing, maintaining, and removing temporary erosion and sedimentation controls as required by Rules and Regulations and permit conditions.
2. Temporary erosion controls include, but are not limited to, grassing, mulching, setting, watering and re-seeding on-site surfaces and soil and borrow area surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the OWNER.
3. Temporary sedimentation controls include, but are not limited to silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the OWNER.
4. CONTRACTOR is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.

B. Related Work Described Elsewhere:

1. Excavation, Backfill and Embankment: Section 31 23 00.
2. Grassing, Mulching and Sodding: Section 32 92 00.

PART 2 – PRODUCTS

2.01 EROSION CONTROL

- A. Sodding is specified in Section 32 92 00.
- B. Netting shall be fabricated of material acceptable to the OWNER.

2.02 SEDIMENTATION CONTROL

- A. Bales shall be clean, seed-free cereal hay type.
- B. Netting shall be fabricated of material acceptable to the OWNER.
- C. Filter stone shall be crushed stone which conforms to Florida Department of Transportation (FDOT) specifications.
- D. Concrete block shall be hollow, non-load bearing type.
- E. Concrete shall be exterior grade not less than one inch (1") thick.

PART 3 – EXECUTION

3.01 EROSION CONTROL

- A. Minimum procedures for grassing are:
 1. Scarify slopes to a depth of not less than six inches (6") and remove large clods, rock, stumps, roots larger than one-half inch (1/2") in diameter and debris.
 2. Sow seed within 24 hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.
 3. Apply mulch loosely and to a thickness of between three-quarter inches (3/4") and one and one-half inches (1-1/2").
 4. Apply netting over mulched areas on sloped surfaces.
 5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.

3.02 SEDIMENTATION CONTROL

- A. Install and maintain silt dams, traps, barriers, and appurtenances as shown on the approved descriptions and working drawings. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.03 PERFORMANCE

- A. Should any of the temporary erosion and sediment control measures employed by the CONTRACTOR fail to produce results which comply with the requirements of the State of Florida, the OWNER or ENGINEER, the CONTRACTOR shall immediately take whatever steps are necessary to correct the deficiency at his own expense.

END OF SECTION

SECTION 01 60 00
MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Conform to applicable specifications and standards.
2. Comply with size, make, type and quality specified, or as specifically approved in writing by ENGINEER.
3. Manufactured and fabricated products:
 - a. Design, fabricate and assemble in accordance with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - c. Two (2) or more items of the same kind shall be identical, by the same manufacturer.
 - d. Products shall be suitable for service conditions.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 APPROVAL OF MATERIALS

- A. Only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by CONTRACTOR shall be subject to the inspection and approval of ENGINEER. No material shall be delivered to the work without prior approval of ENGINEER.
- B. Within 20 days after the Effective Date of the Agreement, CONTRACTOR shall submit to ENGINEER, data relating to materials and equipment he proposes to furnish for the work. Such data shall be in sufficient detail to enable ENGINEER to identify the particular product to form an opinion as to its conformity to the specifications.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by CONTRACTOR. If ENGINEER requires, either prior to beginning or during progress of the work, CONTRACTOR shall submit samples of materials

for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples shall be furnished, stored, packed and shipped as directed at CONTRACTOR's expense. Except as otherwise noted, CONTRACTOR shall make arrangements for and pay for the tests.

- D. CONTRACTOR shall submit data and samples sufficiently early to permit consideration and approval before materials are necessary for incorporation in the work. Any delay of approval resulting from CONTRACTOR's failure to submit samples or data promptly shall not be used as a basis of claim against OWNER or ENGINEER.
- E. In order to demonstrate the proficiency of workers or to facilitate the choice among several textures, types, finishes and surfaces, CONTRACTOR shall provide such samples of workmanship or finish as may be required.
- F. The materials and equipment used on the work shall correspond to the approved samples or other data.

1.03 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. The substitution requirements of this Section are in addition to the requirements of the General Conditions and Supplementary Conditions.
- B. The intent of these Specifications is to provide OWNER with a quality facility without discouraging competitive bidding. Substitutions may be submitted and will be evaluated as specified herein.
- C. A Request for Substitution of Product may be submitted after the CONTRACTOR:
 - 1. Has investigated the proposed product and determined that it is equal to or superior to specified product, furnishes a certification to that effect and waives all rights to additional payment or time that may subsequently become necessary due to the failure of the substituted product to perform adequately.
 - 2. Agrees to provide same warranties or bonds for product substitution as for product specified.
 - 3. Agrees to be responsible for coordinating and paying for any necessary changes to other work required by approved substitutions or product options which he selects and shall pay all such costs including the costs of the services of the design professional to revise the Contract Documents, if such revisions are required.
 - 4. Waives all claims for additional costs due to substitution which may subsequently become apparent.

5. Is offering either a substantial credit to the OWNER for acceptance of the substitution or a convincing justification that the product to be provided as the substitution is substantially superior in quality, performance, compatibility with adjacent products, durability, vandal-resistance or in other important ways.

D. ENGINEER's Action:

1. ENGINEER will consider written requests for product substitution for a period of 45 calendar days after the effective date of the Agreement. ENGINEER will review requests for substitutions with reasonable promptness and notify CONTRACTOR in writing of OWNER's decision to accept or reject requested substitutions. Only the OWNER may accept a substitution.
2. Substitution requests made by means of shop drawings or product data submittal will not be considered.
3. After the period of 45 days has elapsed, the only substitution requests which will be considered are those which are made necessary by the removal of the specified products from the market or by other similar, unavoidable circumstances beyond the control of the CONTRACTOR.

1.04 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain, and distribute copies of such instructions to parties involved in the installation, including five copies to ENGINEER.
 1. Maintain one (1) set of complete instructions at the job site during installation and until completion.
- B. Handle, install, correct, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with ENGINEER for further instructions.
 2. Do not proceed with work without clear instructions.
- C. Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.05 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.
 - 1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.06 STORAGE AND PROTECTION

- A. The CONTRACTOR shall furnish a covered, weather-protected storage structure providing a clean, dry, noncorrosive environment for all mechanical equipment, valves, architectural items, electrical and instrumentation equipment, and special equipment to be incorporated into this project. Storage of equipment shall be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including connection of heaters, placing of storage lubricants in equipment, etc. Corroded, damaged or deteriorated equipment and parts shall be replaced before acceptance of the project. Equipment and materials not properly stored will not be included in a payment estimate.
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weathertight enclosures such as buildings or trailers which have a concrete or wooden floor, a roof, and fully closed walls on all sides.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions (i.e. electrical and instrumentation equipment).
 - 3. Protect mechanical and electrical equipment from being contaminated by dust, dirt, and moisture.
 - 4. Store fabricated products above the ground, on blocking or skids prevent soiling and staining. Cover products which are subject to deterioration with impervious sheet coverings, provided adequate ventilation to avoid condensation.
 - 5. Provide heated storage space for material which would be damaged by freezing.

6. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
 7. Prior to the installation of equipment, it shall be stored at locations designated and approved by the ENGINEER.
- C. All materials and equipment to be incorporated in the work shall be handled and stored by CONTRACTOR before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind whatsoever to the material or equipment.
- D. Cement, sand, and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural and miscellaneous steel, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete beams shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking and spalling to a minimum.
- E. All materials which, in the opinion of ENGINEER, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the work, and CONTRACTOR shall receive no compensation for the damaged material or its removal.
- F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored materials and equipment to assure that products are maintained under specified conditions, and free from damage or deterioration.
- G. Protection After Installation: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove covering when no longer needed.
- H. The CONTRACTOR shall be responsible for all material, equipment, and supplies delivered to OWNER under this Contract until final inspection of the work and acceptance thereof by OWNER. In the event, any such material, equipment and supplies are lost, stolen, damaged or destroyed prior to final inspection and acceptance, CONTRACTOR shall replace same without additional cost to OWNER.

- I. Should CONTRACTOR fail to take proper action on storage and handling of equipment supplied under the Contract within seven (7) days after written notice to do so has been given. OWNER retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost associated with these corrections from CONTRACTOR's Contract. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering and any other costs associated with making the necessary corrections.

1.07 SPECIAL TOOLS

- A. Manufacturers of equipment and machinery shall furnish any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations, and maintenance, together with instructions for their use. CONTRACTOR shall preserve and deliver to OWNER these tools and instructions in good order no later than upon completion of the Contract.

1.08 STORAGE AND HANDLING OF EQUIPMENT ON SITE.

- A. Attention shall be given to the storage and handling of equipment on site. As a minimum, the procedure outlined below shall be followed:
 1. Equipment shall not be shipped until approved by ENGINEER. The intent of this requirement is to reduce on-site storage time prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from ENGINEER. Equipment shipped to the site shall be stored in accordance with Paragraph 1.06, herein. Operation and maintenance data shall be submitted to ENGINEER for review prior to shipment of equipment.
 2. All equipment having moving parts such as gears, electric motors, etc. and/or instruments shall be stored in a temperature and humidity controlled building approved by ENGINEER, until such time as the equipment is to be installed.
 3. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.
 4. Manufacturer's storage instructions shall be carefully studied by CONTRACTOR and reviewed with ENGINEER by him. These instructions shall be carefully followed and a written record of this kept by the CONTRACTOR.
 5. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, CONTRACTOR shall start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

6. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. Mechanical equipment to be used in the work, if stored for longer than 90 days, shall have the bearings cleaned, flushed and lubricated prior to testing and startup, at no extra cost to OWNER.
7. Prior to acceptance to the equipment, CONTRACTOR shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at CONTRACTOR's expense.

1.09 WARRANTY

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer as specified. The manufacturer's warranty period shall be concurrent with the CONTRACTOR's for one (1) year after the time of acceptance.

1.10 SPARE PARTS

- A. Spare parts for certain equipment have been specified in the pertinent sections of the Specifications. CONTRACTOR shall collect and store all spare parts so required in an area to be designated by ENGINEER. In addition, CONTRACTOR shall furnish ENGINEER an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each items. Spare parts shall be turned over in conjunction with the "Spare Parts List" as shown. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivered cost.

1.11 GREASE, OIL, AND FUEL

- A. All grease, oil and fuel required for testing of equipment shall be furnished with the respective equipment. OWNER shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by manufacturer with each item of equipment supplied.
- B. CONTRACTOR shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment after initial break-in of the equipment, which in no event shall be any longer than three (3) weeks of operation.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 13

MOBILIZATION

PART 1 – GENERAL

1.01 DEFINITION AND SCOPE

- A. Mobilization shall include the obtaining of all permits, insurance, and bonds; moving onto the site of all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include, but not be limited to, the following principal items.
1. Move onto the site all CONTRACTOR's plant and equipment required for first month operations.
 2. Install temporary construction power, wiring, and lighting facilities.
 3. Establish fire protection plan and safety program.
 4. Secure construction water supply.
 5. Provide field office trailers for CONTRACTOR and as may be specified for OWNER and ENGINEER.
 6. Provide on-site sanitary facilities and potable water facilities as specified.
 7. Arrange for and erect CONTRACTOR's work and storage yard and employee's parking facilities.
 8. Submit all required insurance certificates and bonds.
 9. Obtain all required permits.
 10. Post all OSHA, EPA, Department of Labor, and all other required notices.
 11. Have CONTRACTOR's superintendent at the job site full time.
 12. Submit a detailed construction CPM schedule acceptable to the ENGINEER as specified.

13. Submit a schedule of values of the Work.
14. Submit a schedule of submittals.

1.02 DEMOBILIZATION

- A. Demobilization is the timely and proper removal of all contractor owned material, equipment, or plant, from the job site and the proper restoration or completion of work necessary to bring the site into full compliance with the contract documents.

1.03 PAYMENT FOR MOBILIZATION/DEMOBILIZATION

- A. The CONTRACTOR's attention is directed to the condition that no payment for mobilization, or any part thereof, will be approved for payment under the Contract. Mobilization/Demobilization is a subsidiary obligation of the CONTRACTOR.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 74 00
CLEANING AND WASTE MANAGEMENT

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Execute cleaning, during the progress of Work and at completion of the Work.

1.02 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 – EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute daily cleaning to keep the Work, the site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris, resulting from construction operations or personal activities.
- B. Provide on-site containers for the collection of waste materials, debris, and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically, or as directed by the OWNER and dispose of at legal disposal areas away from the site.

3.02 DUST CONTROL

- A. The CONTRACTOR shall employ construction techniques that minimize the production and distribution of dust.
- B. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- C. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

3.03 FINAL CLEANING

- A. Employee skilled workman for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Prior to final completion, or OWNER occupancy, CONTRACTOR shall conduct an inspection of sight-exposed interior and exterior surfaces and all work areas, to verify that the entire Work site is clean.

END OF SECTION

SECTION 01 74 25

MISCELLANEOUS WORK AND CLEANUP

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. This Section includes operations which cannot be specified in detail as separate items but can be sufficiently described as to the kind and extent to work involved. The CONTRACTOR shall furnish all labor, materials, equipment, and incidentals to complete the work under this Section.
2. The work of this Section includes, but is not limited to, the following:
 - a. Restoring of driveways and fences.
 - b. Cleaning up.
 - c. Incidental work.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials required for this Section shall be of the same quality as materials that are to be restored. Where possible, the CONTRACTOR shall reuse existing materials that are removed and then replaced.

PART 3 – EXECUTION

3.01 RESTORING OF DRIVEWAYS, FENCES, AND SIDEWALKS

- A. Existing public and private driveways and sidewalks disturbed by the CONTRACTOR shall be replaced. Paved drives shall be repaved to the limits and thickness existing prior to construction. Gravel drives shall be replaced and regraded. Concrete driveways and sidewalks shall be replaced.
- B. The CONTRACTOR shall remove, store and replace existing fences during construction. Only the sections directed by the ENGINEER shall be removed. If any section of fence is damaged due to the CONTRACTOR's negligence, it shall be replaced with fencing equal to or better than that damaged, and the work shall be satisfactory to the ENGINEER.

3.02 CLEAN UP

- A. The CONTRACTOR shall remove all construction material, buildings, equipment, and other debris remaining on the job as the result of construction operations and shall render the site of the work in a neat and orderly condition. All suitable excess excavated material shall remain on site.

3.03 INCIDENTAL WORK

- A. Do all incidental work not otherwise specified, but obviously necessary for the proper completion of the contract as specified and as shown on the Drawings.

END OF SECTION

SECTION 01 75 16
START-UP PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Work may be segmented into several phases of construction in a logical order to meet the project schedule. Portions of the Work may be utilized prior to Substantial Completion of all the Work. Also, certain items of equipment are to be temporarily utilized in a phased segment of the Work and then relocated in a subsequent phase in a permanent installation.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PRELIMINARY MATTERS

- A. Start-up Certification: Prior to start-up, successfully complete all testing required of the individual components of work in the presence of the Engineer or is representative.
- B. Demonstrate to the Engineer that all temporary jumpers and/or bypass have been removed and that all components are operating under their own controls as designated.
- C. Coordinate start-up activities with equipment suppliers, subcontractors, and the OWNER's operating personnel at the site and with the Engineer prior to commencing system start-up. All coordination is the responsibility of the CONTRACTOR.

3.02 START-UP

- A. Confirm that all equipment is properly installed and that the flow path through the new work is unobstructed.
- B. Make adjustments as necessary.

3.03 START-UP DEMONSTRATION AND TESTING

- A. After all work components have been constructed, field tested, and started up in accordance with the individual specifications, perform the Start-Up Demonstration and Testing in the presence of the Engineer and the OWNER. The

demonstration shall be held upon completion of all systems at a date to be agreed upon in writing with the OWNER.

- B. Acceptability of the Work's performance will be based on the Work performing as specified, under these actual and simulated operating conditions as defined in the Contract Documents. The intent of the start-up demonstration and testing is for the CONTRACTOR to demonstrate to the OWNER and the Engineer the Work will function as a complete and operable system under normal operating conditions and is ready for acceptance.
- C. Certificate of Completed Demonstration: Submit five (5) copies of Demonstration Certification memo signed by the CONTRACTOR, Subcontractor and OWNER and insert one (1) copy in each Operation and Maintenance Manual.

EQUIPMENT TRAINING & STARTUP CHECKLIST

PROJECT: _____

OWNER: _____

ENGINEER: _____

CONTRACTOR: _____

DATE: _____

STRUCTURE: _____

EQUIPMENT DESCRIPTION: _____

VENDOR: _____

REPRESENTATIVE: _____ INIT.: _____

of training days required: _____ # received: _____

STARTUP/TRAINING DESCRIPTION: _____

COMMENTS: _____

ACCEPTABLE: _____ PARTIALLY ACCEPTABLE: _____ NON-ACCEPTABLE: _____

ATTENDEES:

<u>NAME</u>	<u>AFFILIATION</u>	<u>DATE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Comply with requirement stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.
- B. Related Requirements Described Elsewhere:
 - 1. Cleaning and Waste Management: Section 01 74 00.
 - 2. Start-Up Procedures: Section 01 75 16.
 - 3. Operating and Maintenance Data: Section 01 78 23.
 - 4. Project Record Documents: Section 01 78 39.
 - 5. Warranties: Section 01 78 36.

1.02 SUBSTANTIAL COMPLETION

- A. The Work will not be substantially complete, and CONTRACTOR may not request substantial completion inspection unless the following submittals and work is completed:
 - 1. All Operation and Maintenance manuals have been submitted and approved to the requirements of Section 01 78 23.
 - 2. All equipment has been checked-out by the equipment manufacturer and Certificates of Manufacturer's Check-Out have been submitted as required by Section 01 75 16.
 - 3. All start-up and demonstration testing completed and Certificates of Completed Demonstration submitted to the requirements of Section 01 75 16.
 - 4. Project Record Documents are complete and have been submitted and reviewed to the requirements of Section 01 78 39.
 - 5. All training of OWNER's personnel completed.
 - 6. All areas to be used and occupied are safe, operable in automatic and complete.

7. All building occupancy certificates have been issued by the appropriate building permitting agency.
 8. All painting, finishes, fencing, cleanup, final grading, grassing, planting, sidewalk construction, and paving shall have been completed and ready for inspection.
 9. All deficiencies noted on inspection reports or non-conformances are corrected or the correction plan approved.
- B. When the conditions of paragraph 1.02 A. are met, the CONTRACTOR shall submit to the ENGINEER:
1. A written notice that he considers the Work, or portion thereof, is substantially complete, and request an inspection.
 2. A punchlist of items to be corrected. (Uncompleted work which is not related to the safe, effective, efficient use of the Project may be allowed on the punchlist with the ENGINEER's approval.)
- C. Within a reasonable time after receipt of such notice, the ENGINEER will make an inspection to determine the status of completion.
- D. Should the ENGINEER determine that the Work is not substantially complete:
1. The ENGINEER will promptly notify the CONTRACTOR in writing, giving the reasons therefor.
 2. CONTRACTOR shall remedy the deficiencies in the Work and send another written notice of substantial completion to the ENGINEER.
 3. The ENGINEER will within reasonable time, re-inspect the Work. The CONTRACTOR will be liable for re-inspection fees as described in paragraph 1.04, herein.
- E. When the ENGINEER finds that the Work is substantially complete, he will:
1. Schedule a walk-through of the facility to include the OWNER. ENGINEER shall determine the completeness of the punchlist and readiness of the facility for occupancy by the OWNER.
 2. Prepare and deliver to OWNER a tentative Certificate of Substantial Completion with the tentative punchlist of items to be completed or corrected before final inspection.

3. After consideration of any objections made by the OWNER as provided in Conditions of the Contract, and when the ENGINEER considers the Work substantially complete, he will execute and deliver to the OWNER and the CONTRACTOR a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected. Any incomplete work allowed on a punchlist must be re-inspected upon completion and any deficiencies found will be added to the punchlist.

1.03 FINAL INSPECTION

- A. Prior to CONTRACTOR's request for a final inspection the following submittals and work must be complete:
 1. Project Record Documents must be approved.
 2. All spare parts and maintenance materials must be suitably delivered to the OWNER per the requirements of the Technical Sections of the Specifications.
 3. CONTRACTOR to submit evidence of compliance with requirements of governing authorities.
- B. After satisfying the requirements of paragraph 1.03 A. and when CONTRACTOR considers the Work complete, he shall submit written certification that:
 1. Contract Document requirements have been met.
 2. Work has been inspected for compliance with Contract Documents.
 3. Work has been completed in accordance with Contract Documents.
 4. Equipment and systems have been tested in the presence of the OWNER's representative and are operational.
 5. All punchlist items have been corrected or completed and the Work is ready for final inspection.
- C. The ENGINEER will, within reasonable time, make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- D. Should the ENGINEER consider that the Work is incomplete or defective:
 1. The ENGINEER will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.
 2. CONTRACTOR shall take immediate steps to remedy the stated deficiencies and send another written certification to the ENGINEER that the Work is complete.

3. The ENGINEER will, within a reasonable amount of time, re-inspect the Work and the CONTRACTOR shall be liable for re-inspection fees as described in paragraph 1.04, herein.

- D. When the ENGINEER finds that the Work is acceptable under the Contract Documents, the CONTRACTOR may make closeout submittals.

1.04 RE-INSPECTION FEES

- A. Should the ENGINEER perform re-inspections due to failure of the Work to comply with the claims of status of completion made by the CONTRACTOR:
 1. CONTRACTOR will compensate the OWNER for such additional services.
 2. OWNER will deduct the amount of such compensation from the final payment to the CONTRACTOR.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS

- A. Warranties: To requirements of Section 01 78 36.
- B. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions.
- C. Certificate of Insurance for Products and Completed Operations.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the ENGINEER.
- B. Statement shall reflect all adjustments to the Contract Sum:
 1. The original Contract Sum.
 2. Additions and deductions resulting from:
 - a. Previous change orders or written amendment.
 - b. Allowances.
 - c. Unit prices.
 - d. Deductions for uncorrected work.
 - e. Penalties and bonuses.

- f. Deductions for liquidated damages.
- g. Deductions for re-inspection payments.
- h. Other adjustments.

3. Total Contract Sum, as adjusted.

4. Previous payments.

5. Sum remaining due.

- C. ENGINEER will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.07 FINAL APPLICATION FOR PAYMENT

- A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 23
OPERATING AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Compile product data and related information appropriate for OWNER's maintenance and operation of products furnished under Contract.
2. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of the Specifications.
3. Instruct OWNER's personnel in maintenance of products and in operation of equipment and systems.

B. Related Requirements Described Elsewhere:

1. Section 01 33 23: Shop Drawings.
2. Section 01 78 39: Project Record Documents.
3. Section 01 78 36: Warranties.

1.02 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel:

1. Trained and experienced in maintenance and operation of described products.
2. Familiar with requirements of this Section.
3. Skilled as a technical writer to the extent required to communicate essential data.
4. Skilled as draftsman competent to prepare required drawings.

1.03 FORM OF SUBMITTALS

- A. Prepare data in form of an instructional manual for use by OWNER's personnel.
- B. Hard Copy Format:
 - 1. Size: Eight and one-half inches by 11 inches (8-1/2" x 11").
 - 2. Paper: 20-pound minimum, white, for typed pages.
 - 3. Text: Manufacturer's printed data, or neatly typewritten.
 - 4. Drawings:
 - a. Provide reinforced punched binder tab, bind in with text.
 - b. Reduce larger drawings and fold to size of text pages but not larger than 14 inches x 17 inches (14" x 17").
 - 5. Provide fly-leaf for each separate product, or each piece of operating equipment.
 - a. Provide typed description of products and major component parts of equipment.
 - b. Provide indexed tabs.
 - 6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
 - a. Title of project.
 - b. Identity of separate structure as applicable.
 - c. Identity of general subject matter covered in the manual.
 - 7. Binders:
 - a. Commercial quality three-post binders with durable and cleanable plastic covers.
 - b. Maximum post width: two inches (2").
 - c. When multiple binders are used, correlate the data into related consistent groupings.
- C. Electronic Format Copy
 - 1. Provide electronic copy of operation and maintenance data on CD/DVD. File(s) should be organized/named to correspond with hard copy.

1.04 CONTENT OF MANUAL

- A. Neatly typewritten table of contents for each volume, arranged in systematic order.
 - 1. CONTRACTOR, name of responsible principal, address, and telephone number.
 - 2. A list of each product required to be included, indexed to content of the volume.
 - 3. List, with each product, name, address, and telephone number of:
 - a. Subcontractor or installer.
 - b. A list of each product required to be included, indexed to content of the volume.
 - c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacement.
 - 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- B. Product Data:
 - 1. Include only those sheets which are pertinent to the specified product.
 - 2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.
- C. Drawings:
 - 1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - 2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 - 3. Do not use Project Record Documents as maintenance drawings.
- D. Written text, as required to supplement product data for the particular installation:
 - 1. Organize in consistent format under separate headings for different procedures.
 - 2. Provide logical sequence of instructions of each procedure.

- E. Copy of each warranty, bond and service contract issued.
 - 1. Provide information sheet for OWNER's personnel, give:
 - a. Proper procedures in event of failure.
 - b. Instances which might affect validity of warranties or bonds.

1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Submit four (4) copies of the complete manual in final form.
- B. Content: for architectural products, applied materials, and finishes:
 - 1. Manufacturer's data, giving full information on products.
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for reordering special manufactured products.
 - 2. Instructions for care and maintenance.
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods which are detrimental to product.
 - c. Recommend schedule for cleaning and maintenance.
- C. Content, for moisture protection and weather-exposed products:
 - 1. Manufacturer's data, giving full information on products.
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance, and repair.
- D. Additional requirements for maintenance data: Respective sections of the Specifications.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 36

WARRANTIES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Compile specified warranties and bonds as specified in these Specifications.
2. Co-execute submittals when so specified.
3. Review submittals to verify compliance with Contract Documents.
4. Submit to ENGINEER for review and transmittal to OWNER.

B. Related Work Described Elsewhere:

1. Instructions to Bidders: Bid Bonds.
2. Performance Bond and Payment Bond: Section 00 64 00.

1.02 SUBMITTAL REQUIREMENTS

- A. Assembly warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Number of original signed copies required: Two (2) each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
 1. Product of work item.
 2. Firm, with name of principal, address, and telephone number.
 3. Scope.
 4. Date of beginning of warranty, bond, or service and maintenance contract.

5. Duration of warranty, bond, or service maintenance contract.
6. Provide information for OWNER's personnel:
 - a. Proper procedure in case of failure.
 - b. Instances which might affect the validity of warranty or bond.
7. CONTRACTOR, name of responsible principal, address, and telephone numbers.

1.03 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 1. Size: Eight and one-half inches by 11 inches (8-1/2" x 11"), punch sheets for standard three-post binder.
 - a. Fold larger sheets to fit into binders.
 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
 - a. Title of Project.
 - b. Name of CONTRACTOR.
- C. Binders: Commercial quality, three (3)-post binder, with durable and cleanable plastic covers and maximum post width of two inches (2").

1.04 WARRANTY SUBMITTALS REQUIREMENTS

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. Manufacturer's warranty period shall be concurrent with CONTRACTOR's for one (1) year, unless otherwise specified, commencing at the time of final acceptance by OWNER.
- B. CONTRACTOR shall be responsible for obtaining certificates for equipment warranty for all major equipment which has at least a one (1) hp motor or which lists for more than \$1,000. ENGINEER reserves the right to request warranties for equipment not classified as major. CONTRACTOR shall still warrant equipment not considered to be "major" in the CONTRACTOR's one (1) year warranty period even though certificates of warranty may not be required.

- C. In the event that the equipment manufacturer or supplier is unwilling to provide a one (1) year warranty commencing at the time of OWNER acceptance, the CONTRACTOR shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two (2) year warranty from the manufacturer shall not relieve the CONTRACTOR of the one (1) year warranty starting at the time of OWNER acceptance of the equipment.
- D. OWNER shall incur no labor or equipment cost during the guarantee period.
- E. Guarantee shall cover all necessary labor, equipment and replacement parts resulting from faulty or inadequate design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by manufacturer.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Maintain at the site for the OWNER one record copy of:
1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications of the contract.
 5. ENGINEER's Field Orders or written instructions.
 6. Approved Shop Drawings.
 7. Field Test records.
 8. Construction photographs, preconstruction videos, and pipeline videos.
 9. Preliminary as-built drawings.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in CONTRACTOR's field office apart from documents used for construction.
1. Provide files and racks for storage of documents.
 2. Provide locked cabinet or secure storage space for storage of samples.
- B. File documents and samples in accordance with CSI format with section numbers as provided herein.
- C. Maintain documents in a clean, dry, legible condition, and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by the ENGINEER.

- E. As a prerequisite for monthly progress payments, the CONTRACTOR shall provide the currently updated “Record Documents” for review by the ENGINEER and OWNER.

1.03 MARKING DEVICES

- A. Provide felt tip marking pens for recording information in the color code designated by the ENGINEER.

1.04 RECORDING

- A. Label each document “PROJECT RECORD” in neat large printed letters.
- B. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
- C. Drawings: Legibly mark to record actual construction:
 1. Depths of various elements of foundation in relation to finish first floor datum.
 2. All underground piping with elevations and dimensions. Change to piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe materials, class, etc.
 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 4. Field changes of dimensional and detail.
 5. Changes made by Field Order or by Change Order.
 6. Details not on original contract drawings.
 7. Equipment and piping relocations.
 8. Major architectural and structural changes including relocation of doors, windows, etc.
 9. Architectural schedule changes according to CONTRACTOR’s records or shop drawings.
 - a. CONTRACTOR shall provide copies of all such recordings to the CONTRACTOR’s surveyor for incorporation into the preliminary and final as-builts drawings.

- D. Specifications and Addenda: Legibly mark each section to record:
1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 2. Changes made by Field Order or by Change Order.
- E. Shop Drawings (after final review and approval): Provide four (4) sets of record drawings for each process equipment, piping, electrical system, and instrumentation system.

1.05 SUBMITTAL

- A. Accompany each submittal with transmittal letter in duplicate, containing:
1. Date.
 2. Project title and number.
 3. CONTRACTOR's name and address.
 4. Title and number of each Record Document.
 5. Signature of CONTRACTOR or his authorized representative.
- B. Preliminary As-built Drawings: The CONTRACTOR shall submit to the ENGINEER two (2) paper copies of preliminary as-built drawings prepared and signed/sealed by the CONTRACTOR's surveyor with each monthly progress payment request. Preliminary as-built drawings shall conform to the requirements of final as-built drawings and shall represent the completed work to date. Preliminary as-built drawings shall include all work which the CONTRACTOR is requesting to be paid for.
- C. Final As-built Drawings: Upon project closeout and as a prerequisite to the final pay request, the CONTRACTOR shall submit to the ENGINEER final as-built drawings Administrative Code, pursuant to Section 472.027 of the Florida Statutes. The ENGINEER shall supply the CONTRACTOR copies of AutoCad files and/or mylar sepias of the original construction plans for the CONTRACTOR's use in the as-built drawing preparation. Final as-built drawings shall include all work which the CONTRACTOR is requesting to be paid for. The final as-built drawing submittal shall include:
1. Two (2) sets of paper plans signed and sealed by a professional land surveyor licensed in the State of Florida CD(s) or other media containing AutoCad, version 14, drawing files.

2. AutoCad drawing files shall include as-built information on layers separate from the original drawing layers and shall be named descriptively to represent the as-built features. (i.e.- Layer “wat ab” and “wat ab txt” for water as-built linework and text, respectively.) Drawing entities are to be shown on the correct layer. All as-built entities shall have color and line type set “bylayer”. Text sizes shall be relative to the plotted scale. Additional details or exploded views shall be included to accurately and fully represent the as-built conditions.
3. Certification by surveyor that the as-built information shown is accurate and that all improvements shown were constructed within or on public rights-of-way, easements or property specifically owned by the OWNER. Certification shall be to the OWNER, ENGINEER and St. Johns River Water Management (if applicable.)
4. No linework and text shall be erased from the original design (construction) drawings during the as-built drawing preparation. Original linework or text shall be circled if accurate or stricken (not erased) if not with the accurate information noted/shown. New linework and text shall be provided to accurately show the as-built information for the constructed improvements. Revisions to design dimensions alone will not be permitted.
5. Pressure Pipeline and Utility Conduit Improvements: For utility improvement projects, horizontal locations of the constructed pipelines with respect to the right-of-way lines or other readily visible, permanent features at 100 foot (100') minimum intervals and at critical locations such as road intersections shall be shown. For treatment plant and pump station improvements, horizontal locations shall be provided at 20 foot (20') intervals. Vertical locations of the constructed pipelines by elevation of centerline of pipe for above ground/exposed pipe or with respect to finished grade over buried pipe shall be shown at 100 feet (100') minimum intervals. (i.e. final cover) For underground piping, all valves, blow-offs, stub-outs, pigging stations, fire hydrants, backflow preventers and services shall be located horizontally in relation to readily visible, permanent features with three-way horizontal dimensions less than 100 feet (100'), each. Three-way dimensions to all buried fittings on treatment plant and pump station improvement projects shall be provided. If adequate features are not available, a station and offset dimensioning system can be used if prior approval is obtained from the ENGINEER. For above ground/exposed pipe, as-built dimensions between fittings or flanges shall be provided. Separations between sanitary hazards to potable water and reclaimed water mains per FDEP shall be shown.
6. Gravity Pipeline Improvements: Show elevations for all inverts, manhole tops, inlet throats/weirs, grate tops, etc. Show size and type of each

structure. As-built length, size, and type of pipes between the structures shall be shown. All service laterals and cleanouts shall be located horizontally to readily visible, permanent features with three way horizontal dimensions less than 100 feet (100'), each. If adequate features are not available, a station and offset dimensioning system can be used if prior approval is obtained from the ENGINEER. A labeling and dimension table scheme is recommended for the three way or station/offset dimensioning. (i.e.-constructed feature labeled as "A", permanent feature labeled as "B", "A"- "B" dimension shown in table for distance measured between the two. Use continuous labeling and complete single table per plan sheet.) Separations between gravity "sanitary hazards" to potable water and reclaimed water mains per FDEP shall be shown.

7. Roadway Improvements: Elevation, size and location of swales, ditches, gutter flow-lines, edge of pavement, and road crown on both sides of the road if applicable shall be provided at 100 foot (100') minimum intervals and at critical areas such as intersections and inlets/flumes. As-built points of curvature, tangent and vertical intersection, along with radii of road alignment, intersecting streets and driveways and other alignment information shall be provided.
8. Stormwater Improvements: The limits, slopes, and bottom depths of stormwater ponds, swales and other retention areas shall be provided. All stormwater piping information shall conform to the Gravity Pipeline Improvement requirements. Size, type, material, and elevations of all stormwater structures, including appurtenances such as weirs, orifices, skimmer plates, etc. shall be shown. As-built information shall conform to St. Johns River Water Management District requirements.
9. Treatment Facility Improvements: Location, size, number, and type of treatment equipment and structures shall be shown. Applicable requirements of as-built information listed herein for similar improvements shall be required.
10. Building Improvements: Finished floor elevations, ceiling heights, building locations, wall opening dimensions, equipment (electrical, mechanical, plumbing) locations, etc. shall be provided. Change of material shall be specifically noted as such.
11. Landscaping Improvements: Number, type, size, and general location of installed plant material shall be provided. Change of material shall be specifically noted as such. Location of irrigation meters, services, manual valves, automatic valves, controllers, rain shut off switches, etc. shall be shown. Changes to the designed irrigation system shall be shown.

12. Other Improvements: Changes from the original design of other improvements such as electrical, mechanical, and structural improvements shall be noted as such on the as-built drawings with the size, number, type, and location of the constructed/installed improvements noted.
13. CONTRACTOR may be required to reimburse the OWNER for services rendered by the ENGINEER for review of multiple resubmittals per SC-6.17, 1. of Section 00 80 00: Supplementary Conditions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 08 30 05

ACCESS HATCHES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work. This Section includes providing all labor, materials, and equipment necessary to install the access hatch doors or the collection basin and the flow meter vault as indicated in the Drawings and/or specified herein.

1.02 QUALITY ASSURANCE

- A. Standards. The access doors shall meet the standards of the following:
 - 1. Standard Building Code.
 - 2. OSHA Requirements.
- B. Manufacturers. Halliday Products, Orlando, Florida; The Bilco Company, New Haven, Connecticut; or approved equal.

1.03 SUBMITTALS

- A. Shop Drawings. Shop drawings shall be submitted to the ENGINEER for approval. Shop drawings shall include manufacturer's data sheets showing all materials, connections, and other required details to illustrate a complete operating access door.

1.04 WARRANTY AND GUARANTEES

- A. The manufacturer shall guarantee the access door against defects in material and workmanship for a period of 10 years. Refer to Section 01 78 39 for requirements.

PART 2 – PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The access doors, in sizes as shown on the drawings, shall be standard design of the manufacturer.

2.02 MATERIALS

- A. Each hatch shall be designed according to the openings shown on the Drawings. The aluminum access frames shall be manufactured from one-third inch (1/3") thick, one (1) piece extruded aluminum frame. The frame shall be a self-draining channel with one and one-half inch (1-1/2") draining coupling located in the channel frame. The door panels shall close flush and shall be one-third inch (1/3") thick aluminum diamond (checker) plate. The installed access doors shall be designed to withstand traffic loads, as required. Removable aluminum cross-beams shall be provided by the hatch supplier as required to accomplish the stated loadings. The doors shall have stainless steel hinges with tamper proof fasteners. All hardware shall be made of 316L stainless steel. Each door shall have spring operators, such that the maximum lifting effort is less than 25 pounds. The hatch supplier shall provide the number of doors as required to accomplish the lifting requirements. Each door shall open to 90 degrees (90°) and lock automatically with a stainless steel, positive locking arm and a stainless steel release handle. Each door shall have a recessed stainless steel lifting handle.
- B. All access doors shall be designed with a neoprene gasket on the inside lip of the frame perimeter, to form an essentially air-tight seal.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The access hatches and doors shall be installed as recommended by the manufacturer and adjusted for proper operation without binding.

END OF SECTION

SECTION 22 13 29

SANITARY SEWERAGE PUMPS – GENERAL

PART 1 – GENERAL

1.01 WORK INCLUDED – DESCRIPTION

- A. Scope of Work: Furnish all labor, materials, equipment, and incidentals required to install complete and ready for operation all pumps related equipment.
- B. Except as specified to the contrary in the specific pump specifications, this specification shall be complied with for all pumping units.
- C. Related Work Described Elsewhere:
 - 1. Shop Drawings: Section 01 33 23.
 - 2. Material and Equipment: Section 01 60 00.
 - 3. Start-up: Section 01 75 16.
 - 4. Operations and Maintenance Data: Section 01 78 23.
 - 5. Warranties: Section 01 78 36.
 - 6. Pipe and Pipe Fittings: Division 33.
 - 7. Valve and Specialties – General: Division 40.
 - 8. General Mechanical Requirements: Section 46 05 01.
 - 9. Instrumentation: Division 33 and respective equipment sections.
 - 10. Motors and Starters: Division 33.
- D. General Design: Refer to respective sections of the specifications.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. The pumping units specified herein are to be standard pumping units for the intended service and shall be the product of a fully experienced, reputable, and qualified manufacturer. The manufacturer shall supply the ENGINEER with information pertaining to three (3) installations where equipment of the specific type, size and function have been in operation for not less than five (5) years with the shop drawing submittal. The information shall contain items as follows:
 - a. Installation name and location.
 - b. Date of installation of equipment.
 - c. Date of start up of equipment.
 - d. Personnel at installation which can be contacted with telephone numbers and extensions.
2. The Supplier shall supply the services of a qualified factory-trained service representative for a period specified under the individual equipment specifications. The representative shall inspect the completed equipment installation to ensure that it meets with the manufacturer's recommendations. Any adjustments or modifications shall be made, at not additional cost to the OWNER, to place the equipment in trouble-free operation.

B. Equipment Manufacturer: Refer to respective sections of the contract documents.

1.03 SUBMITTALS

A. Materials and Shop Drawings:

1. The CONTRACTOR to conform shop drawings to Section 01 33 23 and as required below.
2. The CONTRACTOR shall submit the following to the ENGINEER for approval in accordance with Section 01 33 23:
 - a. Manufacturer's literature, illustrations, and applicable data for the individual pumps, including the total weight of the equipment and the weight of the single largest item.
 - b. Manufacturer's certified curves illustrating pump characteristics of head, discharge, brake horsepower, efficiency, required net positive suction head, and available suction lift.
 - 1) Curves shall be submitted on eight and one-half inch by 11 inch (8-1/2" x 11") sheets, at as large a scale as is practical. Curves shall be plotted from no flow at shut off head to

maximum pump runout head and gallonage allowed by the manufacturer. Curves for variable speed pumps shall be provided for maximum running, full load RPM as specified, and a minimum of four (4) other curves of equal speed increments not inclusive of O RPM (i.e., 1760, 1408, 1056, 704, 352).

- 2) Points of operation which cause bearing stress or shaft deflection in excess of the manufacturer's tolerances for continuous operation shall be indicated on the submitted curves.

- c. The shop drawings shall include details of pump assembly, installation layouts, procedures, types of materials used in pump construction, details on all pump accessories, and dimensions of major components. Where applicable, and pumps are provided as part of a complete package inclusive of controls, control diagrams shall be provided.
- d. A complete total bill of materials for all equipment.
- e. A list of manufacturer's recommended spare parts to be supplied, with the manufacturer's current price for each item. Include O-rings, seals, etc. on the list. List bearings by the bearing manufacturer's name and numbers only.
- f. Pumping equipment, requiring special tools for maintenance, shall be provided with one set of tools labeled, packed with instructions for use, and housed in a metal tool box with lock end hoop for each two units provided.
- g. Motor data shall be submitted in accordance with the specific equipment specification and Section 33 05 93.

B. Operating and Maintenance Instructions: For all pumps furnished under this Section, the CONTRACTOR shall submit operation and maintenance manuals in accordance with requirements of Section 01 78 23 to include, at a minimum, the following:

1. Equipment function.
2. Description.
3. Normal and limiting operating characteristics.
4. Installation instructions (assembly, alignment, and adjustment procedures).
5. Operation instructions (normal start up and shut down procedures, normal operating conditions, and emergency situations).
6. Lubrication and maintenance instructions.
7. Troubleshooting guide.

8. Parts list and predicted life of parts subject to wear.
9. Drawings - cross sectional view, assembly, and wiring diagrams.
10. Performance curves.

C. Factory Performance Test Data:

1. After acceptance of pump shop drawings, factory performance test data will be submitted for approval on each pumping unit. Duplicate units require factory testing for only specified flow and head conditions, unless otherwise specified under the specific pump specification. Tests conducted in accordance with these specifications on similar units within 24 months may be submitted in lieu of tests on the actual units to be supplied.
2. Test shall be certified by a registered Professional Engineer.
3. Tests shall be in accordance with the standards of the Hydraulic Institute including head, capacity, brake horsepower, pump efficiency and NPSH.

- D. Certifications: The CONTRACTOR shall furnish the ENGINEER with a written certification signed by the manufacturer's representative that the equipment has been properly installed and lubricated, is in accurate alignment, is free from undue stress imposed by piping or mounting bolts, and has been operated under full load conditions and that satisfactory operation has been obtained. Refer to Section 01 75 16 for more details.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Refer to Section 01 60 00.
- B. Finished surfaces of all exposed pump openings shall be protected by wooden blanks.
- C. After hydrostatic or other tests, all entrapped water shall be drained prior to shipment, and proper care shall be taken to protect parts from the entrance of water during shipment, storage, and handling.
- D. Each box or package shall be properly marked to show its net weight in addition to its contents.
- E. For equipment, such as pumping units, which require field alignment and connections, the Contract shall provide the services of the equipment manufacturer's qualified mechanic, millwright, machinist, or authorized representative, to align the pump and motor prior to making piping connections or anchoring the pump base.
- F. Precision gauges and levels shall be used in setting all equipment. All piping and equipment shall be perfectly aligned, horizontally and vertically. Tolerances for

pipng and equipment installation shall be one-half inch (1/2") in 30 foot (30') horizontal and vertical. All valves and operators shall be installed in the position shown on the plans or as directed by the ENGINEER if not shown.

1.05 WARRANTY AND GUARANTEES

- A. Refer to Section 01 78 36.
- B. Certifications: The CONTRACTOR shall furnish the ENGINEER with a written certification signed by the manufacturer's representative, in accordance with Section 01 75 16, that the installed equipment:
 - 1. Has been installed per manufacturer's requirements.
 - 2. Has been lubricated per manufacturer's instructions.
 - 3. Has been accurately aligned and proper running clearance set.
 - 4. Is free from undue stress imposed by piping or mounting bolts.
 - 5. Suction lines and seal water lines have been flushed and all debris removed prior to startup.
 - 6. Is ready to be operated on a continuous basis and is free from any known defects.
- C. The nominal nameplate horsepower rating for the motors at their rated speed shall not be exceeded by the driven equipment at any point of operation on its characteristics curve.

PART 2 – PRODUCTS

2.01 GENERAL

- A. The equipment covered by these Specifications shall be designed, constructed, and installed in accordance with the best practice and methods.
- B. All parts shall be so designed and proportioned as to have liberal strength and stiffness, and to be especially adapted for the work to be done. Ample room and facilities shall be provided for inspection, repairs, and adjustment.
- C. Pump bases shall be rigidly and accurately anchored into position, precisely leveled, and aligned, so that the completed installation is free from stress or distortion. All necessary foundation bolts, plates, nuts, and washers shall be furnished and installed by the CONTRACTOR and conform to the recommendations and instructions of the equipment manufacturer. Anchor bolts, nuts, and washers shall be stainless steel unless noted otherwise. Grouting under bases after the equipment is set is included

as work under this Section. Pumps and pump bases shall have adequate provisions to collect drainage and conduct it away to nearest drain.

D. Data Plates:

1. Stainless steel pump nameplates giving the name of the manufacturer, the rated capacity, head, speed, and any other pertinent data shall be attached to each pump.
2. Stainless steel motor nameplates giving the name of the manufacturer, serial number, model number, horsepower, speed, voltage, amperes, and all other pertinent data shall be attached to each motor.

- E. All pumps shall be designed and built for 24-hour continuous service at any and all points within the specified range of operation, without overheating, without cavitation, and without excessive vibration or strain.

2.02 SPARE PARTS (TO BE SUPPLIED IN ACCORDANCE W/ MANUFACTURER RECOMMENDATIONS)

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation of pumping equipment by the CONTRACTOR shall be in strict accordance with the respective manufacturer's instructions and recommendations in the locations shown on the Drawings. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations.
- B. The CONTRACTOR shall furnish and install four and one-half inch (4-1/2") oil dampened pressure gauges on all pump discharge volutes with isolators and isolation valves. Where it is not practical to mount pressure gauges on pump volutes, gauges shall be mounted in the discharge piping.

3.03 FIELD PAINTING

- A. All nameplates shall be properly protected during painting.

3.04 INSPECTION AND TESTING

- A. After all pumps have been completely installed the CONTRACTOR shall conduct, in the presence of the ENGINEER, field tests to indicate that pump efficiency and discharge conform to the Specifications. Field tests shall include all pumps included

under this Division. The CONTRACTOR shall supply all oil, grease, electric power, water, wastewater, chemical solutions, and all other material necessary to complete the field tests.

- B. If the pump performance does not meet the Specifications, corrective measures shall be immediately taken by the manufacturer, or pumps shall be removed and replaced with pumps which satisfy the conditions specified, without cost to the OWNER.
- C. The components of each seal lubricating system shall be completely tested by the CONTRACTOR in the presence of the ENGINEER. Any component parts which are damaged as a result of testing or which fail to meet requirements of this Specification shall be replaced, reinstalled and retested at the CONTRACTOR's expense.
- D. The pumps and motors shall be designed and constructed to avoid the generation of objectionable noise or vibration. The sound pressure level at full load shall not exceed 85 (A Scale) decibels above 300 cycles when measured at a point not exceeding five feet (5') from the motor. Mufflers or external baffles will not be accepted. When operating at any point or vertical plane at the top of the motor shall not exceed hydraulic institute standards.
- E. Field Testing:
 - 1. Upon completion of all the mechanical work, the CONTRACTOR shall conduct testing as specified herein to demonstrate that the equipment performs in accordance with all specifications.
 - 2. The CONTRACTOR shall perform initial testing of the equipment insuring to himself that the tests listed in the Demonstration Test paragraph below can be completed.
 - 3. The Demonstration Test shall demonstrate that all items of these Specifications have been met by the equipment, as installed, and shall include the following tests.
 - a. That the pumps can deliver specified pressure and quantity at rated efficiency.
 - b. That the pump controls perform satisfactorily (where pump control combinations are supplied).
 - 4. In the event that the equipment does not meet the Demonstration Test, the CONTRACTOR shall, at his own expense, make such changes and adjustments in the equipment which he deems necessary and shall conduct further tests until written certification is received from the ENGINEER.

5. The data shall include the following:
 - a. A vibration survey.
 - b. Motor current and amp load.
 - c. Certified alignment.

END OF SECTION

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Description of Work. Extent of electrical connections (EICn) for equipment is indicated by drawings and schedules. Electric connections are hereby defined to include, but not necessarily limited to, connections for providing electrical power to equipment.
- B. The foregoing “General Requirements” form a part of this contract and all the requirements set forth shall be binding upon this subcontractor.
- C. The work required under this Division shall include all materials, labor and auxiliaries required to install a complete and properly operating electrical system. The electrical system required under this Division consists basically of, but is not limited to the following:
 - 1. Complete distribution system for lighting including the necessary feeders, branch circuits, lighting fixtures, control switches and receptacles.
 - 2. Complete distribution system for power including feeders, and connections to motors and other power loads.
 - 3. Underground feeders to panelboards, motor control centers including necessary risers, etc.
 - 4. A building ground system and special grounds as required.
 - 5. Final connections to equipment as noted or required.
 - 6. Motor control centers.
 - 7. Connecting motors and manual control (unless otherwise specified).
 - 8. Painting (of special equipment).
 - 9. Electrical specialties.

10. Concrete work for pad mounted equipment, encased raceways, or grade mounted lighting.
 11. Furnishing and installing all necessary access panels.
 12. Exterior lighting system.
 13. Fire alarm and fire detection system.
 14. Lightning and grounding system.
 15. A complete conduit and wire schedule.
- D. Extent of electrical related work required by this section is indicated on drawings and schedules, and/or specified in other sections.
- E. Types of electrical related work specified in this section include the following:
1. Access to Electrical Work.
 2. Access doors in walls, ceiling, and floors.
 3. Removable cover plates in walls, ceilings, and floors.
 4. Excavating for Electrical Work:
 - a. Underground electrical wiring and service tunnels.
 - b. Power and lighting poles.
 5. Concrete for Electrical Work:
 - a. Electrical equipment foundations and mounting pads.
 - b. Patching concrete which has been cut to accommodate electrical work.
 6. Printing and Electrical Work:
 - a. Ferrous metal surfaces (does not include stainless steel).
 - b. Exterior cast-iron handhole and manhole covers and similar units are excluded from work to be painted.
 - c. Aluminum, which is not specifically anodized as final finish is so indicated.
 - d. Concealed work is excluded from painting, except for interior work in "high humidity" areas.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 01

ELECTRICAL REFERENCE SYMBOLS

PART 1 – GENERAL

1.01 SYMBOLS

- A. The foregoing “General Requirements” form a part of this contract and all the requirements set forth shall be binding upon this subcontractor.
- B. In general, the symbols used on the drawings conform to the Standard Symbols of the Institute of Electrical and Electronic Engineers, with the exception of special systems or agencies as hereinafter noted.
1. Special Symbols as shown in schedules or legends.

1.02 ABBREVIATIONS

- A. The following abbreviations or initials are used:

A/C	Air Conditioning
AC	Alternating Current
AFF	Above Finished Floor
AFG	Above Finished Grade
AHU	Air Handling Unit
AIC	Amps Interrupting Capacity
AMP	Ampere
ANSI	American National Standards Institute
ATS	Automatic Transfer Switch
AUX	Auxiliary
AWG	American Wire Gauge
C	Conduit
CB	Circuit Breaker
CBM	Certified Ballast Manufacturers
Clg	Ceiling
COND	Conductor

Conn	Connection
CT	Current Transformer
CU	Copper
DO	Draw Out
DN	Down
DPST	Double Pole Single Throw
EC	Electrical Contractor
EMT	Electric Metallic Tubing
EO	Electrically Operated
FLA	Full Load Amperes
FM	Factory Mutual
FT	Feet
GFI	Ground Fault Interrupting
Gnd	Ground
Horiz	Horizontal
Hp	Horsepower
Hr	Hour
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
In	Inches
IPCEA	Insulated Power Cable Engineers Association
JB	Junction Box
KV	Kilovolt
KVA	Kilo-Volt-Amps
KW	Kilowatts
LBS	Pounds
Max	Maximum
MCB	Main Circuit Breaker
MCP	Motor Circuit Protector
Min	Minimum
MLO	Main Lugs Only

MTD	Mounted
N	Neutral
NEC	National Electric Code
NECA	National Electrical Contractors
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIC	Not in Contract
NF	Non-Fused
No	Number
/O	Phase
OL	Overload
OLS	Overloads
OSHA	Occupational Safety and Health Act
P	Pole
PB	Pullbox
PNL	Panel
PR	Pair
Pri	Primary
PT	Potential Transformer
PVC	Polyvinal Chloride
RMS	Root-Means-Square
Recept.	Receptacle
SCA	Short Circuit Amps
SH	Shielded
S/N	Solid Neutral
SPST	Single Pole Single Throw
SW	Switch
SWBD	Switchboard
TEL	Telephone
TYP	Typical
T/P	Twisted Pair

Temp	Temperature
UL	Underwriters Laboratories
V	Volt
W	Wire
WP	Weatherproof

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 02
CODES, FEES, AND STANDARDS

PART 1 – GENERAL

1.01 CODES AND FEES

- A. The foregoing “General Requirements” form a part of this contract and all the requirements set forth shall be binding upon this subcontractor.
- B. Install in accordance with latest edition of the National Electric Code and the regulations of governing local, State, County, and other applicable codes. Pay for all required licenses, fees, and inspections.

1.02 STANDARDS

- A. All materials shall be new and free of defects, and shall be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available for certain types of equipment, test data shall be submitted to prove to the ENGINEER that equipment meets or exceeds available standards.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 03
SPECIAL REQUIREMENTS

PART 1 – GENERAL

1.01 AUXILIARIES AND ACCESSORIES

- A. The foregoing “Project Requirements”, Div.1, Section 01 00 00, form a part of this contract and all the requirements set forth shall be binding upon this subcontractor.
- B. Include all auxiliaries and accessories for complete and properly operating systems.

1.02 LAYOUT OF WORK

- A. Drawings are diagrammatic. Correlate final equipment locations with governing Architectural and Structural drawings. Lay out before installation so that all trades may install equipment in spaces available. Provide coordination as required for installation in a neat and workmanlike manner.

1.03 INVESTIGATION OF SITE

- A. Check site and existing conditions thoroughly before bidding. Advise ENGINEER in writing of discrepancies or questions noted.

1.04 SUPERVISION OF THE WORK

- A. Provide field superintendent who has had a minimum of four (4) years previous successful experience on projects of comparable sizes and complexity. At least one (1) member of the Electrical Contracting Firm shall hold a State Master Certificate of Competency.

1.05 COORDINATION

- A. Provide all required coordination and supervision where work connects to or is affected by work of others and comply with all requirements affecting this Division. Work required under other divisions, specifications, or drawings to be performed by this Division shall be coordinated with the CONTRACTOR and such work performed at no additional cost to OWNER.

1.06 BASIS FOR WIRING DESIGN

- A. The drawings and specifications describe specific sizes of switches, breakers, fuses, conduits, conductors, motor starters, and other items of wiring equipment. Wherever the CONTRACTOR provides power consuming equipment which differs from drawings and specifications, the wiring and associated circuit components for such

equipment shall be changed to proper sizes to match at no additional expense to the OWNER.

1.07 PROVISIONS FOR OPENINGS

- A. Locate all openings required for work performed under this section. Provide sleeves, guards, or other approved methods to allow passage of items installed under this section.

1.08 CONCRETE PADS

- A. Furnish and install reinforced concrete pads for transformers, and motor control centers, of size as shown on the drawings or required. Unless otherwise noted, pads shall be four inches (4") high and shall exceed dimensions of equipment being set on them, including future sections, by six inches (6") on all sides, except when equipment is flush against a wall, then the side or sides against the wall shall be flush against a wall, then the side or sides against the wall shall be flush with the equipment. Chamfer top edges one-half inch (1/2") with forms. Trowel all surface smooth.

1.09 SURFACE MOUNTED EQUIPMENT

- A. Surface mount fixtures, outlets, cabinets, conduit, panels, etc., shall have finish or shall be painted as directed by ENGINEER. Paint shall be in accordance with other applicable sections of these specifications.

1.10 MATERIALS

- A. Reference: "General Requirements of the Contract", Div. 1.

1.11 SUBSTITUTIONS

- A. Reference: "General Requirements of the Contract", Div. 1.

1.12 ADDITIONAL REQUIREMENTS

- A. Keep two (2) sets of white prints on the job, and neatly marked up design drawings each day as components are installed. Different colored pencils shall be used as directed for different systems. Cost of prints shall be included under this Division. All items on Progress Drawings shall be shown in actual location installed. Change any equipment schedules to agree with items actually furnished.
- B. Prior to request for final payment furnish a set of neatly marked prints of drawings to General Contractor.
- C. Submit for checking a specific set of written Operating Instructions on each item which required instructions to operate. After approval, provide one (1) additional copy for insertion in each Technical Information Brochure.

- D. Submit for approval Maintenance Information consisting of manufacturer's printed instructions and parts lists for each major item of equipment. After approval, insert information in each Technical Information Brochure.
- E. The work required under this Division shall include a one (1)-year guarantee unless otherwise noted. This guarantee shall be by the CONTRACTOR to the OWNER for any defective workmanship or material which has been furnished under this Contract at no cost to the OWNER for a period of one (1) year from the date of substantial completion of the System. This guarantee shall not include light bulbs in service after one (1) month from date of Substantial Completion of the System. Explain the provisions of guarantee to the OWNER at the "Demonstration of Completed System".
- F. All work on the System shall be completed, and all forms and other information shall be submitted for approval one (1) week before the request for final inspection of the building.

1.13 CUTTING AND PATCHING

- A. Reference: "General Requirements of the Contract", Div. 1.
- B. Supplementary Requirements: Any cutting of work in place shall be patched and decorated by such mechanics and in such a manner that the quality of workmanship and finish shall be compatible with that of adjacent construction.

1.14 PROPRIETARY NAMES

- A. For convenience of description and as a standard for grade, type, quality, and performance characteristics, proprietary names are included with some description. This does not imply preference to specific manufacturers (except where multiple choice is specified or where otherwise noted to match existing conditions), but minimum requirements with approval to be made by the ENGINEER.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 04

DEMONSTRATION OF COMPLETED ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SCOPE

- A. Demonstrate the essential features of the following electrical systems:
1. Communications systems.
 - a. Alarms and bells.
 - b. Fire detection devices, smoke detection devices.
 - c. Telephone equipment.
 2. Electrical entrance equipment.
 - a. Circuit breakers.
 - b. Fuses and fuse holders.
 - c. Meter.
 3. Electrical systems, controls, and equipment.
 - a. Electrical power equipment.
 - b. Motor control centers.
 - c. Motor control devices.
 - d. Relays.
 - e. Special transformers.
 - f. Starting devices.
 4. Lighting fixtures (include relamping and replacing lenses).
 - a. Exit and safety fixtures.
 - b. Fixtures, indoor and outdoor.
 - c. Floodlighting.
 5. Lightning protection system.

6. Panel boards.
 - a. Distribution panels.
 - b. Lighting panels.
 - c. Load centers.
 - d. Main panels, power panels.
7. Standby Electrical Equipment.
 - a. Batteries.
 - b. Battery Chargers.
 - c. Motor-generator sets.
 - d. Transfer switch.
 - e. Day Tank.
 - f. Controls and alarms.
8. Wiring devices.
 - a. Face plates.
 - b. Low-voltage controls.
 - c. Outlets: convenience, special purpose.
 - d. Switches: regular, time.

B. Each system shall be demonstrated once only, after completion of testing.

1.02 TIME

- A. The demonstration shall be held upon completion of all systems at a date to be agreed upon in writing by the OWNER or his representative.

1.03 ATTENDING PARTIES

- A. The demonstration shall be held by this CONTRACTOR in the presence of the OWNER, and the manufacturer's representative.

1.04 DEMONSTRATION

- A. Demonstrate the function and location (in the structure) of each system, and indicate its relationship to the riser diagrams and drawings.
- B. Demonstrate by "start-stop operation" how to work the controls, how to reset protective devices, how to replace fuses, and what to do in the case of emergency.

1.05 CERTIFICATE OF COMPLETED DEMONSTRATION

- A. Submit five (5) copies of “Certificate of Completed Demonstration”, memo signed by the CONTRACTOR, Subcontractor, and OWNER and insert one (1) copy in each Technical Information Brochure.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 06

ELECTRICAL CONNECTION FOR EQUIPMENT

PART 1 – GENERAL

- A. Type of electrical power connections specified in this section includes the following:
 - 1. To motors,
 - 2. To motor starters,
 - 3. From motor starters to motors,
 - 4. To lighting fixtures,
 - 5. To transformers, rheostats, and similar current adjustment features of equipment,
 - 6. To ground, and
 - 7. To master units of communication, signal, alarm, clock, public address, sound, and video systems.

PART 2 – QUALITY ASSURANCE

2.01 NEC COMPLIANCE.

- A. Comply with applicable portions of NEC as to type products used and installation of electrical power connections (terminals and splices), for junction boxes, motor starters, and disconnect switches.
- B. NEMA Compliance. Comply with applicable portions of NEMA standards pertaining to electrical connections for equipment.
- C. ANSI Compliance. Comply with applicable ANSI standards pertaining to products and installation of electrical connections.
- D. Splices and terminations of types indicated.

2.02 METAL CONDUIT, TUBING, AND FITTINGS

- A. General. Provide metal conduit, tubing and fittings of types, grades, sizes, and weights (wall thicknesses) indicated for each type service. Where types and grades are not indicated, provide proper selection as determined for installer to fulfill wiring requirements; comply with NEC requirements for raceways. Provide products complying with Division 26 basic materials and methods section "Raceways", and in accordance with the following listing of metal conduit, tubing, and fittings:

1. Rigid Steel Conduit Flexible Metal Conduit Fittings.
2. Rigid Metal Conduit Fittings Liquid-Tight Flexible Metal Conduit.
3. Electrical Metallic Tubing Liquid-Tight Flexible Metal Conduit Fittings.
4. Flexible Metal Conduit.

2.03 WIRE, CABLE, AND CONNECTORS

- A. General. Provide wires, cables and connectors complying with Division 26 basic materials and methods section "Wire and Cables".
- B. Wire. Unless otherwise indicated, provide wires/conductors for electrical connections which match wires/conductors of wiring supplying power.
- C. Connectors and Terminals. Provide electrical connectors and terminals as recommended by connector and terminal manufacturer for intended applications.

2.04 ELECTRICAL CONNECTION ACCESSORIES

- A. Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, solder, electrical soldering flux, wire nuts and cable ties as recommended for use by accessories manufacturers for type services indicated.

PART 3 – EXECUTION

3.01 INSTALLATION OF ELECTRICAL CONNECTIONS

- A. Install electrical connections as indicated; in accordance with connector manufacturer's written instructions and with recognized industry practices, and complying with requirements of NEC and NECA's "Standard of Installation" to ensure that products fulfill requirements.
- B. Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Wherever possible, mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.
- C. Coordinate installation of electrical connections for equipment with equipment installation work.
- D. Cover splices with electrical insulation equivalent to, or of higher rating, than insulation on conductors being spliced.
- E. Prepare cables and wires by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where cables and wires are terminated.

- F. Trim cables and wires as short as practical and arrange routing to facilitate inspection, testing and maintenance.
- G. Tighten wire-binding connector screws firmly.
- H. Provide flexible conduit for motor connections and for other electrical equipment connections where subject to movement and vibration.
- I. Provide liquid-tight flexible conduit for connection of motors and for other electrical equipment where subject to movement and vibration, and also where subjected to one or more of the following conditions:
 - 1. Exterior location.
 - 2. Moist or humid atmosphere where condensate can be expected to accumulate.
 - 3. Corrosive atmosphere.
 - 4. Subjected to water spray.
 - 5. Subjected to dripping oil, grease, or water.
- J. Refer to basic materials and methods section for identification of electrical power supply conductor terminations with markers approved as to types, colors, letter, and marker sizes, by Architect/Engineer. Affix markers at each point of termination, as close as possible to each point of connection.

END OF SECTION

SECTION 26 05 13

WIRES AND CABLES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of electrical wire and electrical cable work is indicated by drawings and schedules.
- B. Types of wire, cable and connectors in this section include the following:
 - 1. Copper Conductors.
 - 2. Tab Type Connectors.
 - 3. Split-Bolt Connectors.
- C. Applications for wire, cable and connectors required for project as follows:
 - 1. Power Distribution circuitry.
 - 2. Lighting Circuitry.
 - 3. Appliance and Equipment circuitry.
 - 4. Motor-Branch Circuitry.

PART 2 – QUALITY ASSURANCE

2.01 COMPLIANCE

- A. Comply with NEC as applicable to construction and installation of electrical wire, cable, and connectors.
- B. UL Compliance. Comply with UL standards pertaining to wire, cable and connectors.
- C. UL Labels. Provide electrical wires, cables and connectors which have been UL listed and labeled.
- D. NEMA/ICEA Compliance. Comply with applicable portions of NEMA/Insulated Cable Engineers Association standards pertaining to material, construction and testing of wire and cable.

- E. ANSI/ASTM. Comply with applicable portions of ANSI/ASTM standards pertaining to construction of wire and cable.

PART 3 – EXECUTION

3.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturers. Subject to compliance with requirements, provide products of one of the following (for each type of wire, cable, and connector):
 - 1. Wire and Cable.
 - a. General Cable Corporation.
 - b. Southwire Company.
 - c. Triangle PWC, Inc.
 - 2. Connectors.
 - a. AMP, Inc.
 - b. Burndy Corporation.
 - c. Ideal Industries, Inc.
 - d. Thomas and Betts Company.

3.02 WIRE, CABLE, AND CONNECTORS

- A. General. Except as otherwise indicated, provide wire, cable, and connectors of manufacturer's standard materials, as indicated by published product information; designed and constructed as recommended by manufacturer, and as required for installation.
- B. Wire. Provide factory-fabricated wire of sizes, ratings, materials, and types indicated for each service. Where not indicated, provide proper selection as determined by installer to comply with project's installation requirements and NEC standards. Select from the following types, materials, conductors, configurations, insulation, and coverings:
 - 1. UL Type: MTW.
 - 2. UL Type: THHN.
 - 3. UL Type: THWN.

- C. Material: Copper.
 - 1. Conductors: Solid (AWG 20 to AWG 8 only).
 - 2. Conductors: Concentric-lay-stranded (standard flexibility).
 - 3. Outer Covering: Thermoplastic.
- D. Cable. Provide factory-fabricated, metal connectors of sizes, ratings, materials, types, and classes as indicated for each service. Where not indicated, provide proper selection as determined by installer to comply with installation requirements and NEC standards.

3.03 CONNECTORS

- A. Provide factory-fabricated, metal connectors of sizes, ratings, material, types, and classes as indicated for each service. Where not indicated, provide proper selection as determined by installer to comply with installation requirements and NEC standards. Select from the following types, classes, kinds, and styles.
 - 1. Type: Pressure.
 - 2. Class: Non-insulated.
 - 3. Kind: Copper (for Cu to Cu connection).
 - 4. Style: Butt connection.
 - 5. Style: Split-bolt parallel connection.
 - 6. Style: Tap connection.
 - 7. Style: Pigtail connection.

PART 4 – INSTALLATION

1.01 GENERAL

- A. Install electrical cables, wires and connectors as indicated, in compliance with manufacturer's written instruction, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices.
- B. Coordinate cable and wire installation work with electrical raceway and equipment installation work, as necessary for proper interface.
- C. Use pulling compound or lubricant, where necessary; compound must not deteriorate conductor or installation.

- D. Keep conductor splices to a minimum.
- E. Install splices and tapes which have mechanical strength and insulation rating equivalent-or-better than conductor.
- F. Field Quality Control. Prior to delivery, test cable and wire for continuity of circuitry, and also for short circuits. Correct malfunctions when detected.
- G. Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements.

END OF SECTION

SECTION 26 05 26

GROUNDING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of grounding work is indicated by drawings and schedules.
- B. Application of grounding work in this section includes the following:
 - 1. Underground Metal Piping.
 - 2. Metal Building Frames.
 - 3. Grounding Electrodes.
 - 4. Separately Derived Systems.
 - 5. Service Equipment.
 - 6. Enclosures.
 - 7. Equipment.
- C. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications.
- D. Conductors. Copper cable; strand dia. 0.045 foot (0.045"); 14 strands.
- E. Ground Rods. Solid copper five-eighths inch (5/8") dia. by 10 feet (10').

PART 2 – INSTALLATION

2.10 GENERAL

- A. Install electrical grounding systems where shown, in accordance with applicable portion of NEC, with NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 33.13

CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. General. Provide metal conduit, tubing and fittings of types, grades, sizes, and weights (wall thicknesses) for each service indicated. Where types and grades are not indicated, provide proper selection determined by installer to fulfill wiring requirements, and comply with applicable portions of NEC for raceways.

1. Rigid Steel Conduit. FS WW-C-0581 and ANSI C80.1.
2. Rigid Metal Conduit Fittings. FS W-F-408.
3. Use Type 1 Fittings for rain-tight connections.
4. Use Type 1 Fittings for concrete tight connections.
5. Use Type 3 Fittings for other miscellaneous connections.
6. Electrical Metallic Tubing (EMT). FS WW-C-563 and ANSI C80.3.

NOTE: IN GENERAL, EMT RACEWAYS SHALL NOT BE USED ON THIS PROJECT

- B. EMT Fittings. FS W-F-408.

1. Use Type 1 Fittings for rain-tight connections.
2. Use Type 2 Fittings for concrete tight connections.
3. Use Type 3 Fittings for other miscellaneous connections.

- C. Flexible Metal Conduits. FW WW-C-566, of the following type:

1. Type 2. Zinc-coated steel.
2. Flexible Metal Conduit Fittings. FS W-F-406, Type 1, Class 1, and Style A.
3. Liquid-Tight Flexible Metal Conduit. Provide liquid-tight flexible metal conduit; construct of single strip, flexible, continuous, interlocked, and double-wrapped steel; galvanized inside and outside; coat with liquid-tight jacket of flexible polyvinyl chloride (PVC).
- 4.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 33.16

BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of electrical box and electrical fittings work is indicated by drawings and schedules.
- B. Types of electrical boxes and fittings in this section include the following:
 - 1. Outlet Boxes.
 - 2. Junction Boxes.
 - 3. Pull Boxes.
 - 4. Conduit Bodies.
 - 5. Bushings.
 - 6. Knockout Closures.

PART 2 – QUALITY ASSURANCE

2.01 COMPLIANCE

- A. Comply with NEC as applicable for construction and installation of electrical wiring boxes and fittings.
- B. UL Compliance. Provide electrical boxes and fittings which have been UL listed and labeled.
- C. ANSI/NEMA Standards Compliance. Comply with ASNI 134.1 (NEMA Standards PUB No. OS 1) as applicable to sheet-steel outlet boxes, device boxes, covers, and box supports.

2.02 FABRICATED MATERIALS

- A. Interior Outlet Boxes.
 - 1. Provide galvanized flat rolled sheet steel interior outlet wiring boxes, of types, shapes, and sizes, including box depths, to suit each respective location and installation; construct with stamped knockouts in back and sides, and with thread screw holes with corrosion-resistant screws for securing box covers and wiring devices.

2. Manufacturer. Subject to compliance with requirements, provide interior outlet boxes of one of the following:

- a. Adalet-PLM Div., Scott and Fetzer Co.
- b. Appleton Electric Company.
- c. Bell Electric/Square D Co.
- d. RACO, Inc.
- e. Steel City/Midland-Ross Corp.

B. Weatherproof Outlet Boxes.

1. Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of types, shapes, and sizes, including depth of boxes, with threaded conduit ends, cast-metal face plates and spring-tipped waterproof caps suitably configured for each application, including face plate gaskets and corrosion-resistant fasteners.
2. Manufacturer. Subject to compliance with requirements, provide weatherproof outlet boxes of one of the following:

- a. Bell Electric/Square D Co.
- b. Harvey Hubbel, Inc.
- c. O-Z/ Gedney Co.

C. Junction and Pull Boxes.

1. Provide galvanized code-gauge sheet junction and pull boxes, with screw-on covers; of types, shapes, and sizes, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws, and washers.
2. Manufacturer. Subject to compliance with requirements, provide junction and pull boxes of one of the following:

- a. Adelet-PLM Div., Scott Fetzer Co.
- b. Appleton Electric Co.
- c. Bell Electric/ Square D Co.
- d. Spring City Elect. Mfg. Co.

D. Conduit Bodies.

1. Provide galvanized cast-metal conduit bodies, of types, shapes, and sizes, to suit respective location, construct with thread-conduit-entrance ends, removable covers, and corrosion-resistant screws.
2. Manufacturer. Subject to compliance with requirements, provide conduit bodies of one of the following:

- a. Appleton Electric Co.
- b. Killark Electric Mfg. Co.
- c. O-Z/Gedney Co.

E. Bushings, Knockout Closures, and Locknuts.

- 1. Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and malleable iron conduit bushings, offset connectors, of types and sizes, to suit respective uses and installations.

PART 3 – EXECUTION

3.01 INSTALLATION OF ELECTRICAL BOXES AND FITTINGS

A. General.

- 1. Install electrical boxes and fittings where indicated, complying with manufacturer's written instruction, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.
- 2. Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work.
- 3. Provide weatherproof outlets for interior and exterior locations exposed to weather and moisture.
- 4. Provide knockout closure to cap unused knockout holes where blanks have been removed.
- 5. Install boxes and conduit bodies in those locations to ensure ready accessibility of electrical wiring.
- 6. Avoid using round boxes where conduit must enter box through side of box, which would result in difficult and insecure connections when fastened with locknut or bushing on rounded surface.
- 7. Fasten boxes rigidly to substrates or structural to which attached, or solidly embedded electrical boxes in concrete or masonry.
- 8. Provide electrical connections for installed boxes.

END OF SECTION

SECTION 26 05 43

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Underground Duct Lines.

1. Description of Assembly

- a. Underground duct lines where shown shall be of individual conduits encased in concrete. The conduit shall be of plastic, unless indicated or specified otherwise. The conduit used shall not be smaller than four inches (4") in diameter, inside, unless otherwise noted. The concrete encasement surrounding the duct bank shall be reinforced as shown and rectangular in cross-section, having a minimum concrete thickness of three inches (3"). Conduit shall be separated by a minimum concrete thickness of three inches (3").
- b. The concrete work shall conform to Sections on "Concrete". The top of the concrete envelope shall be not less than 18 inches (18") below grade. Concrete shall be installed in a continuous pour to eliminate joints in the duct run. Duct lines shall have a continuous slope downward toward manholes and away from buildings with a pitch of not less than 3 inches (3") in 100 feet (100'). Changes in direction of runs exceeding a total of 10 degrees (10°) either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet (25'), except that manufactured bends may be made up of one or more curved or straightened sections or combinations thereof. Manufactured bends shall have a minimum radius of 36 inches (36"). Right angle bends shall be rigid steel black mastic coated.
- c. Conduits shall terminate in end-bells where duct lines enter manholes. Separators shall be of precast concrete, high impact polystyrene, steel, or any combination of these. The joints of the conduits shall be staggered by rows so as to provide a duct line having the maximum strength. During construction, partially complete duct lines shall be protected from the entrance of debris, such as mud, sand, and dirt by means of suitable conduit plugs. As the duct line is completed, a testing mandrel not less than 13 inches (13") long with a diameter 1/4 inch (1/4") less than the size of the stiff bristles shall be drawn through until the conduit is clear of all particles of earth, sand, or gravel; conduit plug shall then be immediately installed.

- d. Plastic conduit, fittings and joints shall not have been stored in the sun or weather. In any excessively heated space, or unevenly supported during storage. Use and installation shall be in accordance with NEC requirements for the installation of non-metallic rigid conduit. Plastic conduit shall be protected against the direct rays of the sun prior to installation. Conduit shall be Carlon Type EB, Queen City Plastics, or equal. Conduit shall be U.L. listed and conform to NEMA Standard TC6-1972.
- e. Trenches for duct banks shall be completely dry before setting conduits or pouring concrete. Well pointing as required will be provided if necessary to keep trench dry.
- f. Wires and cables in manhole shall be placed on cable racks. Manhole shall be cleaned of all loose materials, dirt, and debris immediately after completion of new work and shall be in a clean condition with insulators. Racks shall be McGraw Edison NOB-LOC type, Chance, or equal.
- g. Backfilling shall be in layers not more than 8 inches (8") deep, and shall be thoroughly tamped. The first layer shall be earth or sand, free from particles that would be retained on a 1/4" inch (1/4") sieve. The succeeding layers shall be excavated material having stones no larger than would pass through a 4-inch (4") ring. The backfill shall be level with adjacent surface, except that in sodded or paved areas, a space equal to the thickness of the sod or paving shall be left.
- h. The surface disturbed during the installation of duct shall be restored to its original elevation and condition if not refinished in connection with site work.
- i. All unused conduit openings shall be plugged or capped with a suitable device designed for the purpose; caulking compound shall not be used for plugging conduit openings.
- j. One (1) No. 4 bare stranded copper counterpoise shall be run above all duct banks and shall be run into all manholes and handholes and grounded. Counterpoise shall run to building and be grounded at each building service ground.

B. Raceways.

- 1. Extent of raceways is indicated by drawings and schedules. Types of raceways in this section include the following:
 - a. Electrical Metallic Tubing.
 - b. Flexible Metal Conduit.
 - c. Intermediate Metal Conduit.
 - d. Liquid-Tight Flexible Metal Conduit.
 - e. Rigid Metal Conduit.
 - f. Rigid Nonmetallic Conduit.
 - g. Surface Metal Raceways.

2. NEMA Compliance. Comply with applicable requirements to NEMA standards pertaining to raceways.
3. UL Compliance and Labeling. Comply with provisions of UL safety standards pertaining to electrical raceway systems; and provide products and components which have been UL listed and labeled.
4. NEC Compliance. Comply with requirements as applicable to construction and installation of raceway systems.

NOTE: IN GENERAL, EMT RACEWAYS SHALL NOT BE USED ON THIS PROJECT

1.02 WIREWAYS

- A. General. Provide electrical raceways of types, grades, sizes, weights (wall thicknesses), number of channels, for each type service indicated. Provide complete assembly of raceway including, but not necessarily limited to, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps and other components and accessories as needed for complete system. Where types and grades are not indicated, provide proper selection as determined by installer to fulfill wiring requirements, and comply with applicable provisions of NEC for electrical raceways.

1.03 SUBMITTALS

- A. Submit shop drawings or cut sheets on:
 1. Conduit.
 2. Fittings.
 3. Separators.
 4. PVC solvent.

PART 2 – PRODUCTS

2.01 INSTALLATION OF ELECTRICAL RACEWAYS

- A. Install electrical raceways where indicated; in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA "Standard of Installation", and comply with recognized industry practices.
- B. Coordinate with other work, including metal can concrete deck work, as necessary to interface installation of electrical raceways and components with other work.

- C. Coat under floor metal raceways with bitumastic type protective coating prior to placing concrete.
- D. Level and square raceway runs, and install at proper elevations/heights.
- E. Complete installation of electrical raceways before starting installation of cables/wires within raceways.
- F. Install PVC-coated conduit and fittings in highly corrosive atmospheres, and elsewhere as indicated.
- G. Install flexible conduit for motor connections and for other electrical equipment connections where subject to movement and vibration.
- H. Install liquid-tight flexible conduit for connection of motors and for other electrical equipment where subject to movement and vibration and also where subject to one or more of the following conditions:
 - 1. Exterior location, moist or humid atmosphere where condensate can be expected to accumulate, corrosive atmosphere, subjected to water spray, subjected to dripping oil, grease, or water.
- I. Wherever possible, install horizontal raceway runs above water and steam piping.

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 53
ELECTRICAL IDENTIFICATION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of electrical identification work is indicated by drawings and schedules.
- B. Types of electrical identification work specified in this section include the following:
 - 1. Electrical Power, Control and Communication Conductors, and Danger Signs.
 - 2. Refer to appropriate section “Identification System”, for equipment and system nameplates, and performance data, not work of this section.

PART 2 – PRODUCTS

2.01 Acceptable Manufacturers.

- A. Subject to compliance with requirements, provide electrical identification products of one of the following (for each type of marker):
 - 1. W.H. Brady Co.
 - 2. Ideal Industries, Inc.

2.02 Cable/Conductor Identification Bands.

- A. General. Provide manufacturer’s standard vinyl-cloth, self-adhesive cable/conductor markers of wrap-around type, either pre-numbers plastic coated/type, or write-on type with clear plastic self-adhesive cover flap; numbered to show circuit identification.

PART 3 – EXECUTION

3.01 EQUIPMENT/SYSTEM IDENTIFICATION

- A. General.
 - 1. Install engraved plastic-laminate sign on each major unit of electrical equipment in building; including central or master unit of each electrical system including communication/control/signal systems, unless unit is

specified, with its own identification. Provide single line text, one-half inch (1/2") high lettering on one and a half foot (1-1/2') high sign, and white lettering in black field. Provide text matching terminology and numbering of the contract documents and shop drawings. Provide signs for each unit of the following categories or electrical work.

2. Panelboards, electrical cabinets, and enclosures. Access panel/doors to electrical facilities; major electrical switchgear; motor control centers and transformers.
3. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate substrate.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent of wiring device work is indicated by drawings and schedules. Wiring devices are defined as single discrete units of electrical distribution systems which are intended to carry but not utilize electric energy.
- B. Types of electrical wiring devices in this section include the following:
 - 1. Receptacles.
 - 2. Switch.
 - 3. Wall Plates.
 - 4. Plugs.
 - 5. Plug Connectors.

PART 2 – QUALITY ASSURANCE

2.01 COMPLIANCE.

- A. Comply with NEC as applicable to construction and installation of electrical wiring devices.
- B. UL Compliance and Labeling. Provide electrical wiring devices which have been UL listed and labeled.
- C. NEMA Compliance. Comply with NEMA standards for general and specific purpose wiring devices.
- D. Submittals.
 - 1. Product Data. Submit manufacturer's data on electrical wiring devices.

PART 3 – PRODUCTS

3.01 MANUFACTURER

- A. Subject to compliance with requirements, provide products of one of the following (for each type of wiring device):
 - 1. Harvey Hubbell, Inc.
 - 2. Levington Mfg. Co.
- B. Fabricated Wiring Devices
 - 1. General. Provide factory-fabricated wiring devices, in types colors, and electrical rating, for applications indicated, and complies with NEMA Standards Pub. No. WD1. Where types and grades are not indicated, provide proper selection as determined by installer to fulfill wiring requirements, and complying with NEC and NEMA standards for wiring devices. Provide ivory color devices and wall plates except as otherwise selected; color selection to be verified by CONTRACTOR with ENGINEER.

3.02 RECEPTACLES

- A. Heavy-Duty Duplex. Provide heavy-duty duplex receptacles, two (2)-pole, three (3)-wire grounding, 20-amperes, 125-volts, with metal plaster ears, back wiring, NEMA configuration 5-20R, unless otherwise indicated.
- B. Ground Fault Interrupter. Provide general-duty duplex receptacles, ground-fault circuit interrupters; feed-thru type, capable of protecting connected downstream receptacles on single circuit, grounding type UL-rated Class A, Group 1, 20-amperes rating, 120-volts, 60 Hz; with solid-state ground-fault sensing and signaling; with five (5) milliamperes ground-fault trip level; equip with 20-ampere plug configuration, NEMA 5-20R.

3.03 PLUGS AND CONNECTORS

- A. Plugs. Provide 15-amperes, 125-volts, 3-wire grounding, armored cap plugs, parallel blades with cord clamp, and four-tenths inch (0.4") cord hole; match NEMA configuration with power sources.
- B. Connectors. Provide 15-amperes, 125-volts, bakelite-body armored connectors three (3)-wire grounding, parallel blades, double wipe contact, with cord clamp, and four-tenths inch (0.4") cord hole, match NEMA configuration to mating plugs.

3.04 SWITCHES

- A. Snap. Provide general-duty flush single-pole toggle switches, 20-ampere, 277-volts AC, with mounting yoke insulated from mechanism, equip with plaster ears, switch handle, and side wired screw terminals.

PART 4 – WIRING DEVICES

4.01 INSTALLATION

- A. Install wiring devices as indicated, in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices to fulfill project requirements.
- B. Coordinate with other work; include painting, electrical box, and wiring work, necessary to interface installation of wiring devices with other work.
- C. Install wiring devices only in electrical boxes which are clean, free from excess building materials, dirt, and debris.
- D. Install galvanized steel wall plates in unfinished spaces.
- E. Delay installation of wiring devices until wiring work is completed.
- F. Delay installation of wall plates until after painting work is completed.

4.02 GROUNDING.

- A. Provide electrically continuous, tight grounding connections for wiring devices, unless otherwise indicated.

4.03 TESTING.

- A. Prior to energizing circuitry, test wiring devices for electrical continuity and proper polarity connections. After energizing circuitry, test wiring devices to demonstrate compliance with requirements.

END OF SECTION

SECTION 33 00 00
UTILITIES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The Contractor shall furnish and install complete and ready for use, all the equipment, machinery, apparatus, motors, drives, tools, meters, charts and other accessories, and shall perform such operations and tests, all as specified herein, and as indicated on the drawings.
- B. The materials of construction of all equipment furnished and permanently installed on the project shall be of best quality. The workmanship of construction, finish and fit shall be equal to the highest industry standards. All equipment and/or components thereof shall be new and shall not have been in service at any other installation.
- C. The desired standard of quality for each item of equipment is established by reference on the drawings and in the specifications to specific manufacturer's products. Materials of construction and/or fabrication shall equal or exceed the standard of the referenced product. The Contractor's attention is called to Article 1.06.

1.02 EQUIPMENT WARRANTY

- A. All mechanical and electrical equipment, together with devices of whatever nature and all components, which are furnished and/or installed by the Contractor shall be guaranteed against manufacturing and/or design inadequacies, materials and workmanship not in conformity with the paragraph above, improper assembly, hidden damage, failure of devices and/or components, excessive leakage or other circumstances which would cause the equipment to fail under normal design and/or specific operating conditions for a period of two years or such longer period as may be shown and/or specified from and after the date of acceptance of the equipment by the Owner. Each piece of equipment, device or components thereof which shall fail within the above specified term of the guarantee shall be replaced and installed with reasonable promptness by the Contractor without cost to the Owner.
- B. Rotating machinery shall be designed and fabricated to provide satisfactory operation without excessive wear and without excessive maintenance during its operating life. Rotating parts shall be statically and dynamically balanced and shall operate without excessive vibration.

- C. On all equipment ample mean of lubrication shall be provided for all bearings and other metal parts in sliding contact.
- D. The minimum design criteria for lubrication of moving parts of the equipment shall include one week of continuous operation during which no lubricants shall be added to the system. The system shall also be designed to receive lubricants whether in operation or shut down, and shall not leak or waste lubricants under either condition. The manufacturer's recommendations of grade and quality and a supply of lubricants so recommended in quantities sufficient to conduct startup and testing operations shall be furnished with the equipment. Alemite industrial-type fittings, or equal, shall be used for grease lubrication except as noted.

1.03 SPECIAL TOOLS

- A. Special tools, wrenches and thickness or depth gauges required for removing parts and for making adjustment shall be included with each item of equipment having wearing parts and requiring repairs or adjustments. All accessories such as indicating gauges, indicators and lubrication devices necessary for the proper maintenance and operation of the equipment shall be furnished and stored safely at the site of the work and delivered to the Owner after the equipment is accepted.

1.04 SAFETY REQUIREMENTS

- A. Screens, guards or cages shall be provided for all exposed, rotating or moving parts in accordance with accepted practices of applicable governmental regulatory agencies.

1.05 NAMEPLATES

- A. Each major component of equipment shall have the manufacturer's name, catalog and/or model number, and serial number on a corrosion-resistant plate securely attached to the item of equipment.

1.06 INITIAL OPERATION AND TESTS

- A. Upon completion of all the mechanical work, in a manner satisfactory to the Engineer, the Contractor shall designate a day for initial testing of the equipment. Prior to such completion date, the Contractor shall give the Owner seven (7) days notice thereof in writing, and the Owner will then appoint the personnel which will operate the plant equipment, and on the test day designated, the Contractor shall make the initial test to determine the performance using the personnel designated by the Owner and such personnel of his own as is specified or as he deems necessary to complete the tests.
- B. The initial tests shall be limited to a period of twenty-four (24) hour's duration and during this time the mechanical performance of all equipment shall be tested and

demonstrated by the Contractor. If the demonstration and tests indicate satisfactory mechanical performance in the operation of the equipment, the Contractor will then be given a three (3) day notice by the Engineer to make a final guarantee test of the plant equipment under normal operation. During the initial tests and the three (3) day period between the initial tests and the final tests, the Contractor's personnel shall supervise the operation of the plant equipment, assist and train the Owner's operating personnel in their duties. Experts on equipment installation and operation, as specified or necessary as well as complete, written, detailed erection, operation and maintenance instructions, shall be furnished by the Contractor to insure proper training and instruction of the Owner's personnel. A minimum of six complete sets of operation and maintenance instructions shall be provided.

- C. The final guarantee tests shall be for a period of twenty-four (24) hours duration, except as otherwise provided, and shall be made at the conclusion of the three (3) day period of operation and training. These tests shall be made under normal operating conditions under the supervision of the Contractor's personnel. This test is for the purpose of demonstrating that all performance and efficiency guarantees of the equipment and other requirements in compliance with these specifications have been met, that the operation of all equipment is coordinated and that all controls operate satisfactorily in coordination with the equipment installed.
- D. In the event the initial or final guarantee testing and demonstration of equipment and controls does not meet the guarantee conditions or is not demonstrated to the satisfaction of the Engineer, the Contractor shall, at his own expense, make such changes and adjustments in the equipment which he deems necessary and shall conduct further tests until full satisfaction is indicated by the Engineer and written certification is received thereof.

1.07 SHOP PAINT

- A. All ferrous metal on plant equipment, unless otherwise specified or directed by the Engineer, shall receive shop paint compatible with field costs provided by the Contractor, in accordance with the requirements of the section of the specifications entitled, "Painting and Special Coatings in Part A of Technical Specifications.

PART 2 - MATERIALS AND EQUIPMENT

2.01 EQUIPMENT

- A. Equipment Requiring Variations from Structures Shown on the Plans
- B. It is the intent that the Contractor shall furnish equipment which may be installed and shall operate properly in the structure as shown. Should the Contractor select alternate equipment resulting in an alteration to, addition to, enlargement of, or any other changes from the lines, dimensions and grades shown on the drawings, the Contractor shall make such changes or alterations as are required and no additional

payment will be made by the Owner for changes in structures occasioned by the selection of alternate equipment. All such variations shall be subject to review and acceptance by the Engineer.

- C. Equipment requiring supplemental services in addition to those shown or specified in order to fulfill the operating objectives and including additional mechanisms, operating steps and/or controls as compared with specified equipment will not be acceptable.

END OF SECTION

SECTION 33 01 00
OPERATION AND MAINTENANCE OF UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The work included in this Section consists of furnishing all labor, equipment and materials and in performing all operations necessary for the construction or installation of all process and utility piping, valves, valve boxes and all castings and appurtenances within, complete and ready for operation as shown on the Drawings and specified herein.
- B. RELATED WORK SPECIFIED ELSEWHERE
 - 1. Section 31 23 00: Excavation and Fill

1.02 QUALITY ASSURANCE

- A. Construction Requirements:
 - 1. All underground lines shall be installed with at least 30 inches of cover or as detailed on the drawings.
 - 2. For underground utilities changes in pipe alignment and use of fittings may be allowed, subject to approval of the Engineer as to layout. Deflection shall not exceed 80 percent of the maximum allowable deflection as stated in the pipe manufacturer's installation instructions.
- B. Pipe Inspection:
 - 1. The Contractor shall obtain from the pipe manufacturers a certificate of inspection to the effect that the pipe and fittings supplied for this Contract have been inspected at the plant and that they meet the requirements of these specifications. Certification shall be stamped with corporate seal.
 - 2. All pipe and fitting shall be subject to visual inspection at time of delivery by rail or truck and also just before they are lowered into the trench to be laid. Joints or fittings that do not conform to these specifications will be rejected and must be removed immediately by the Contractor.
 - 3. The entire product of any plant may be rejected when, in the opinion of the Engineer, the methods of manufacture fail to secure uniform results, or where the materials used are such as to produce inferior pipe or fittings.

1.03 SUBMITTALS

A. Shop Drawings:

1. In general six (6) copies of the following shop drawings shall be submitted to the Engineer for approval prior to construction:
 - a. Mill test certificates or certified test reports on pipe and fittings
 - b. Details of restrained and flexible joints
 - c. Valve vaults
 - d. Valve boxes
 - e. All gate, plug, ball, solenoid, check valves, and automatic air release valves
 - f. Couplings
 - g. Service saddles, curb, & corp stops.
 - h. Flexible expansion joints
 - i. Pressure gauges
 - j. Identification tape
 - k. Joint lubricant
 - l. Detailed piping layout drawings and pipe laying schedule
 - m. Temporary plug and anchorage system for hydrostatic pressure test
 - n. Tie rods
 - o. Reduces pressure backflow preventers.
2. A separate shop drawing submittal will be required for each major item listed above and for each different type of an item within a major item. For example, separate submittals will be required for gate, plug, ball, solenoid, check and automatic air release valves. All submittals shall be in accordance with the General Conditions and the Supplementary Conditions.

B. Acceptance of Material:

1. The Contractor shall furnish an Affidavit of Compliance certified by the pipe manufacturer that the pipe, fittings and specials furnished under this Contract comply with all applicable provisions of current AWWA and ASTM Standards and these Specifications. No pipe or fittings will be accepted for use in the work on this project until the Affidavit has been submitted and approved by the Engineer.
2. The Owner reserves the right to sample and test any pipe or fitting after delivery and to reject all pipe and fittings represented by any sample which fails to comply with the specified requirements.

C. Operation and Maintenance Manuals:

1. Submit copies of operation and maintenance manuals for all the items requiring routine maintenance.

1.04 DELIVERY, STORAGE AND HANDLING

- A. During shipping, delivering and installing pipe, fittings, valves, backflow preventers, and accessories, they shall be handled in such manner as to ensure a sound undamaged condition.
- B. Particular care shall be taken not to damage the pipe coating.
- C. Insides of valves and backflow preventers shall be kept free of dirt and debris.

1.05 JOB CONDITIONS

A. Water in Excavation:

1. Water shall not be allowed in the trenches while underground pipes are being laid and/or tested. The Contractor shall not open more than 100' of trench than the available pumping facilities are able to dewater to the satisfaction of the Engineer. The Contractor shall assume responsibility for disposing of all water so as not to interfere with the normal drainage of the territory in which he is working.
2. In no case shall the pipelines being installed be used as drains for such water, and the ends of the pipe shall be kept properly and adequately plugged during construction by the use of approved stoppers and not by improvised equipment. All necessary precautions shall be taken to prevent the entrance of mud, sand, or other obstructing matter into the pipelines. If on completion of the work any such materials have entered the pipelines, it must be cleaned as directed by the Engineer so that the entire system will be left clean and unobstructed.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE AND FITTINGS

- A. Ductile Iron Pipe: Ductile iron pipe shall conform to the requirements of ANSI/AWWA C150/A21.50, latest revision. The minimum thickness class for all pipe greater than 12" diameter shall be pressure Class 250, and all pipe 12" or less in diameter shall be pressure Class 350.

Pipe shall have a minimum rated water working pressure of 250 psi and shall be furnished in laying lengths of 20 feet or less, unless specifically shown otherwise on the Drawings. The pipe shall be lined and coated as specified below.

1. Interior Lining for Raw Activated Sludge (RAS), Sludge Lines and Force Mains: Ductile iron fittings and specials shall be coated with 40 mils nominal dry film thickness of Protecto 401 or approved equal in accordance with the manufacturers recommended actions.
 2. Interior Lining for Potable and Reclaimed Water Piping: Ductile iron pipe, fittings and specials shall be cement lined in accordance with ASNI/AWWA C104, current revision, "Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water". The cement lining shall have a standard thickness and after curing the lining shall have a seal coat of bituminous material in accordance with ANSI/AWWA C104, current revision.
 3. Exterior Coatings: The exterior of ductile iron pipe fittings and specials to be installed underground shall be coated at the factory with standard bitumastic coating.
 4. Polyethylene Encasement: Where indicated the Contractor shall utilize polyethylene encasement in accordance with ANSI/AWWA C105-T1. The polyethylene shall conform with ASTM D-1248-68 and be color coded to the service application.
 5. Ductile iron pipe, fittings and specials to be installed aboveground shall be furnished with a shop applied primer on the exterior. The shop primer shall be as specified in accordance with manufacturers recommendations.
- B. Fittings: Fittings for ductile iron pipe shall be either mechanical joint, restrained joint or flanged joint as indicated on the Drawings and shall have a minimum working pressure of 250 psi. Fittings shall be ductile iron and shall conform to ANSI/AWWA C110, ANSI/AWWA C111 and ANSI/AWWA C153, latest revisions for flanged and mechanical joint pipe. Fittings shall be coated and lined as specified above for ductile iron pipe. The rubber gaskets for flanged, mechanical, and push on joints shall be as described below.
- C. Push-On Joints: Pipe using push-on joints shall be in strict accordance with ANSI/AWWA C111, latest revision and shall be as manufactured by American

Cast Iron Pipe Company (Fastite Joint), United States Pipe Company (Tyton Joint), or Clow Corporation (Super Bell Tite Joint). Jointing materials shall be provided by the pipe manufacturer and installation shall be in strict accordance with the manufacturer's recommended practice.

- D. Mechanical Joints: Jointing materials for mechanical joints shall be provided by the pipe and fitting manufacturer. Materials assembly and bolting shall be in strict accordance with ANSI/AWWA C111 and ANSI/AWWA C153, latest revisions. Tee head bolts and nuts for mechanical joints shall be manufactured of CORTEN, high strength, low alloy, corrosion resistant steel as manufactured by NSS Industries, Plymouth, Michigan or an equal approved by the Engineer.
- E. Flanged Joints: Flanges shall be American Standard for 125 pound steam pressure with any special drilling and tapping as required to insure correct alignment and bolting. Gaskets shall be rubber full face type, minimum thickness of 1/8 inch. Flanged joints shall be made with bolts and nuts, studs with a nut on each end, or studs with nuts where the flange is tapped.

The number and size of bolts shall conform to the same American National Standard as the flanges. Unless noted otherwise, bolts and nuts shall be Grade B conforming to the ASTM Specifications for Steel Machine Bolts and Nuts and Tap Bolts, Designation A 307. Bolts and studs shall be of the same quality as machine bolts. Bolts and nuts shall have hexagonal heads. Where noted on the Drawings or where flanges are underground, stainless steel nuts and bolts shall be used for flanges. Stainless steel shall be Type 316 in accordance with ASTM A320, Class 2.

- 1. Machined Surfaces: Machined surfaces shall be cleaned and coated with a suitable rust preventative coating at the shop immediately after being machined.
- F. Restrained Joints: Restrained joints shall be provided for all buried piping systems at the location required to restrain the system thrust. Pipe joints and fitting shall be restrained as specified below.
 - 1. Manufactured Restrained Joints: Manufactured restrained joints shall be Flex-Ring, Lok-Ring or Lok-Fast manufactured by the American Cast Iron Pipe Company, Lok-Tyte or Tr-Flex Type manufactured by the United States Pipe Company as manufactured by McWane, or an equal approved by the Engineer. Joints shall be manufacturer's standard specifically modified push-on type joints with joint restraint provided by ductile iron retainer rings joined together by corrosion resistant, high strength steel tee head bolts and nuts or with joint restraint provided by a welded on retainer ring and a split flexible ring assembled behind the retainer ring.

Restrained joint pipe and fittings shall be ductile iron only and shall comply with applicable portions of this specification. Manufactured restrained joints shall be capable of deflection during assembly. Deflection shall not exceed 80 percent of the manufacturer's recommendations.

Tee head bolts and nuts for restrained joints shall be manufactured of CORTEN, high strength, low alloy, corrosion resistant steel as manufactured by NSS Industries, Plymouth, Michigan, or an equal approved by the Engineer.

2. Alternate Restrained Joints:

- a. When prior approval is obtained from the Engineer, ductile iron pipe and fittings with mechanical joints may be restrained using a follower gland which includes a restraining mechanism. When actuated during installation, the restraining device shall impart multiple wedging action against the pipe wall which increases resistance as internal pressure in the pipeline increases. The pipe must be suitable for use with the proposed device.

The joint shall maintain flexibility after installation. Glands shall be manufactured of ductile iron conforming to ASTM A536 and restraining devices shall be of head treated ductile iron with a minimum hardness of 370 BHN. The gland shall have standard dimension and bolting patterns for mechanical joints conforming to ASNI/AWWA C111 and C153, latest revisions.

Tee head bolts and nuts shall be manufactured of corrosion resistant, high strength, low alloy CORTEN steel in accordance with ASTM A242.

The restraining wedges shall have twist off nuts to insure proper torquing. The mechanical joint restraint device shall have a minimum working pressure rating of 250 psi with a minimum safety factor of 2 to 1 and shall be MEGALUG^R as manufactured by EBBA Iron, Inc.. No other retainer gland type device will be acceptable. After installation prior to backfilling, all parts of the joint restraint system shall be coated with coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M.

- b. When prior approval is obtained from the Engineer, ductile iron pipe and fittings with push on joints may be restrained using a restraining gasket similar to the "Field Lok" gasket manufactured by U.S. Pipe & Foundry. The device must be suitable for the pipe and pressure rating intended and is subject to approval by the Engineer. The required length of restrained joint pipe shall be provided on either side of all valves and fittings employing restraining devices. Restrained lengths shall be calculated per DIPRA standards based on Type II laying conditions and an operating pressure of 150 psi, unless otherwise indicated.

2.02 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

- A. Gravity Drainage Piping: PVC pipe used for gravity drainage piping installed underground shall be SDR 26 pipe.
- B. Small PVC Pressure Piping: Unless otherwise specified, all PVC pressure pipe smaller than 4 inches nominal diameter shall be Schedule 80 PVC or Endot Endpure HDPE, (as shown). Schedule 80 pipe shall have either solvent welded or threaded joints. PVC pressure pipe shall bear the approved seal of the National Sanitation Foundation (NSF). PVC pipe that is exposed to sunlight shall be manufactured with additives to provide resistance to ultraviolet deterioration. No glued joint pipe shall be installed below ground, unless other specified. All water pipe to be Class 200 (DR 21) gasketed bell and spigot pipe blue in color.
- C. Fittings: Socket type, solvent welded fittings for Schedule 80 PVC pipe shall be in conformance with ASTM D2467. Threaded type fittings for Schedule 80 PVC pipe shall be in conformance with ASTM D2464. All solvent welded or threaded joints shall be watertight.
- D. Flanges: Flanges for Schedule 80 PVC pipe shall be rated for a 150 psi working pressure with ANSI B16.1 dimensions and bolting pattern. Flanges shall be connected to PVC piping with either solvent welded or threaded joints in accordance with ASTM D2467 or ASTM 2464, respectively. Gaskets shall be neoprene, full faced type with a minimum thickness of 1/8 inch. Nuts and bolts shall be hexagonal with machine threads, manufactured of Type 316 stainless steel in accordance with ASTM A320, Class 2. Type 316 stainless steel flat washers with lock washers shall be used against PVC flanges.
- E. Solvent Cement: PVC solvent cement shall be in compliance with ASTM D2564 and in accordance with the pipe manufacturer's recommendations.
- F. Thread Lubricant: Lubricant for Schedule 80 threaded joints shall be Teflon tape only.
- G. Polyvinyl Chloride Pipe 4 Inches and Larger in Size for Pressure Service: Polyvinyl chloride pipe for nominal diameters 4 inches to 12 inches in size shall conform to the requirements of AWWA C900 with a dimension ratio of DR 18, pressure class 150, and gasketed integral bell ends. For PVC pipe larger than 12 inches for pressure service, the pipe shall conform to the requirements of AWWA C-905 with a minimum DR of 25, pressure rating of 165 psi, with gasketed integral bell ends. Pipe shall be designed for maximum working pressure of not less than 150 psi and with not less than a 4 to 1 sustained hydrostatic pressure safety factor. Fittings for C-900 PVC pipe shall be ductile iron fittings with restrained joint ends for potable water or reclaimed water lines, and restrained PVC fittings for sanitary force mains.
- H. All PVC pipe installed shall be color coded for the service intended. Potable water piping shall be extruded blue, reclaimed water shall be lavender, force main white, and gravity sewer green. Care shall be taken to avoid exposure to sunlight. Pipe should be marked for its use in three places on the pipe barrel.

I. Joints (4 Inches and Larger PVC Pipe):

1. Bell and Spigot:

Pipe joints shall be made with integral bell and spigot pipe ends. The bell shall consist of an integral thickened wall section designed to be at least as strong as the pipe wall. The bell shall be supplied with factory glued rubber ring gasket with conforms to the manufacturer's standard dimensions and tolerances. The gasket shall meet the requirements of ASTM F477 "Elastomeric Seals (Gaskets) for Joining Plastic Pipe". PVC joints shall be "Ring-Tite" as manufactured by J-M Manufacturing Company, Inc. or an equal approved by the Engineer.

2. Restrained Joints:

Where indicated on Drawings, to prevent pipe joints and fittings from separating under pressure, pipe joints and fittings shall be restrained as follows:

- a. PVC pipe bell and spigot joints shall be restrained with EBBA Iron MEGALUG^R Series 1500 Restrainer or an equal approved by the Engineer. The restraining device and Tee head bolts shall be manufactured of high strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion resistant high strength, low alloy CORTEN steel meeting the requirements of ASTM A242.
- b. Cast iron mechanical joint fittings used with PVC pipe shall be restrained with the EBBA Iron MEGALUG^R Series 2000 PV Restrainer or an equal approved by the Engineer. The restraining device and Tee head bolts shall be manufactured of high strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion resistant high strength, low alloy CORTEN steel meeting the requirements of ASTM A242.
- c. Thrust Blocking. Provided concrete reaction or thrust backing on all pressure pipe lines four (4) inches in diameter or larger (except those having flanged joints or restrained joints) at all tees, plugs, caps, and at bends deflecting 222E or more, or movement shall be prevented by attaching suitable metal rods or straps as directed by the Engineer. Concrete used for this purpose shall be Class "C". Reference reaction blocking table shown on construction plan details.
- d. Joint restraint. Push on joints on either side of valves and fittings restrained by mechanical restraining devices shall be restrained with "Uni-Flange" mechanisms. The number of restrained joints shall be determined by DIPRA methods and a laying schedule shall be provided for approval by the Engineer prior to installation of joint restraint.

2.03 PVC FITTINGS (4 INCHES AND LARGER PVC PIPE)

1. Fittings shall be PVC and manufactured of the same design as the PVC pipe. PVC fittings 4 inches through 36 inches shall be PVC injection molded made of materials meeting or exceeding the requirements of cell class 12454-B material as defined in ASTM D1784. Fittings shall be manufactured with pipe that meets or exceeds AWWA C-905 standard. All PVC fittings must comply with or exceed ANSI/AWWA C907, Uni-B-12, Uni-B-14 standards. All PVC fittings must be certified by CSA to the CSA B137.3 standard as third party certification. The fittings must be of the same design as the PVC pipe with an HDB of 4000 psi and minimum SDR 25 wall thickness design. All fittings must have UL-FM approval, and shall comply with or exceed all ASTM Standards for fittings. Fittings must have NSF-61 certification for contact with potable water. PVC fittings shall be pressure rated to 165 psi or greater.
2. All restrained joint systems shall be pressure rated the same as the PVC pipe and fittings. All components of the restraint system shall meet or exceed all requirements of ANSI/AWWA C-111/A21.11 latest revision. Restraints shall provide a full 360 degree contact on the pipe with sufficient gripping action to secure the clamp to the pipe and be designed so that the restraint action is increased as a result of increases in the line pressure. Restraint devices for PVC pipe and fittings shall consist of split restraint ring installed on the spigot, connected to a split ring which seats behind the gasket race of the fitting. The split restraint ring shall incorporate a series of machined serrations (not "as cast") on the inside diameter to provide positive restraint, exact fit and 360 degree contact and support of the pipe wall. The two halves of the split backup ring shall interlock without the need for additional bolts and shall form a beveled leading edge to assure exact fit behind the fitting gasket race. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12 and connecting bolts shall be of high strength, low alloy material in accordance with ASNI/AWWA C111/A21.11. Restraint devices shall be Uni-Flange 1300 series or other approved restrained joint devices.

2.04 WALL SLEEVES, SEALS, PIPES AND NON-STANDARD CASTINGS

- A. Wall Sleeves: Wall sleeves shall be of cast iron, ductile iron or carbon steel. The sleeve shall be hot dipped galvanized after fabrication and shall have a waterstop located in the center of the wall. Sleeves shall be provided with seals and shall be sized as required for the installation of seals. Sleeves shall terminate flush with finished surfaces of walls and ceilings, and shall extend 2 inches above the finished floor unless otherwise shown on the Drawings.
 1. Wall sleeves shall be installed for all piping passing through building walls and floors, except where noted on the Drawings. Sleeves shall be of sufficient size to pass the pipe without binding. Escutcheons shall be provided at walls and floor to completely conceal the sleeves smaller than 3 inches. Escutcheons shall be 304 SS split-type.

- B. Wall Sleeve Seals: Wall sleeve seals shall be modular mechanical type consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely water-tight seal between the pipe and wall sleeve. The synthetic rubber shall be suitable for exposure to sludge and groundwater. Bolts, nuts and hardware shall be 18-8 stainless steel. The seals shall be Link Seal as manufactured by Thunderline Corporation or equal, and the wall sleeve and seal shall be sized as recommended by the seal manufacturer.
- C. Wall Pipes: Wall pipes shall be of the size and types indicated on the Drawings. All wall pipes shall be of ductile iron and shall have a central fin not less than 2 inch thick and the same diameter as the bolting flange cast midway of the length to form a waterstop. Each wall pipe shall be of the same grade, thickness and interior coating as the piping to which it is joined. Those portions of the wall pipes that are buried shall have a coal tar epoxy outside coating.
- D. Non-Standard Fittings and Castings: Fittings having non-standard dimensions and cast especially for this project shall be of an approved design. Fittings shall be manufactured to meet the requirements of the same specifications and shall have the same diameter and thickness as standard fittings but laying lengths and types of ends shall be determined by positions in the pipelines and by the particular piping to which it is connected. Flange facing and drilling shall conform to the 125 pound American National Standards Institute. Where required, flanges shall be drilled and tapped for studs. Other dimensions shall be substantially equal to corresponding parts of standard bell and spigot fittings.

2.05 PIPE COUPLINGS

- A. Couplings:
 - 1. Pipe couplings used to joint two pieces of plain end pipe shall be sized to suit the outside diameter of the pipe ends to be jointed. Transition couplings shall be used to join pipes of different outside diameters. Pipe couplings shall be bolted type with steel middle ring and end followers. The couplings shall be restrained for the test pressure of line using approved retaining system.
 - 2. All carbon steel parts of the coupling shall be coated on the interior and exterior with a fusion bonded thermosetting epoxy coating with a 12 mil nominal coating thickness. The coating shall be equal to AL-CLAD as manufactured by Dresser Industries, Inc.
 - 3. Gaskets for the coupling shall be wedge type manufactured of Buna-N resilient rubber.

4. Bolts shall be manufactured of high strength Type 304 stainless steel with Type 316 stainless steel hexagonal nuts. Bolts and nuts shall conform dimensionally to ANSI/AWWA C111, latest revision.
5. Couplings shall be Style 38 as manufactured by Dresser Industries, Inc. or an equal approved by the Engineer.

2.06 PVC BALL AND BALL CHECK VALVES

- A. PVC Ball Valves: All PVC ball valves 2 inch through 4 inch in size shall be of a one piece capsule type manufactured of Type 1, Grade 1 PVC. Ball valves shall be true union design with two-way blocking capability and shall have solvent welded socket or NPT threaded ends. Ball valves shall have Teflon seats with Viton backing cushions and Viton O-ring seals, and shall be designed for a 150 psi water working pressure at 120EF. Valves shall be supplied with ABS lever operating handles. PVC ball valves shall be manufactured by Asahi/America, or equal approved by the Engineer.
- B. PVC Ball Check Valves: All PVC ball check valves 1 inch through 2-1/2 inch in size shall be of a solid thermoplastic construction manufactured of Type 1, Grade 1 PVC. Ball check valves shall be true union design with solvent welded socket or NPT threaded ends. Ball check valves shall be furnished with a solid thermoplastic ball. Ball seat shall be Teflon coated Viton. The same seal shall function as both the ball seat and the union seal. PVC ball check valves shall be designed for a 150 psi water working pressure at 120EF. Valves shall be manufactured by Asahi/America, or an equal approved by the Engineer.

2.07 GATE VALVES

- A. Bronze Gate Valves: Gate valves installed aboveground, less than 2 inches in size and smaller, shall be Class 150 all bronze valves conforming to Fed. Spec. WW-V-54d, Type I, Class B designed for a non-shock water pressure of 300 psi. Bronze for valve body and internals shall be in accordance with ASTM B16.18. Valves shall be furnished with screwed ends, handwheel operator, non-rising stem, one-piece solid wedge disc and screwed bonnet. Valves shall be as manufactured by Crane, Powell or an approved equal.
- B. Ductile Iron Gate Valves:
 1. Ductile iron gate valves shall open by turning to the left (counter-clockwise), when viewed from the stem. When fully open, gate valves shall have a clear waterway equal to the nominal diameter of the pipe. Operating nut or hand wheel shall have an arrow cast in the metal indicating the direction of opening. Each valve shall have the manufacturer's distinctive marking, pressure rating and year of manufacture cast in the body. Prior to shipment from the factory, each valve shall be tested by applying to it a hydrostatic pressure equal to twice the specified working pressure. Hydrostatic and leakage tests shall be conducted in strict accordance with ANSI/AWWA C509, latest revisions.

2. Gate valves with nominal sizes from 2 to 24 inches shall conform to ASNI/AWWA C509, latest revision, and shall be designed for a minimum working pressure of 250 psi. Valves shall be ductile iron body resilient seat type with O-ring stem seals. The valve stem, stem nut, glands and bushings shall be manufactured of zinc free bronze. Valve disc shall be constructed to assure uniform seating pressure between disc seat ring and body seating surface. Resilient seat of valve shall be formed by a special corrosion and chloramine resistant, synthetic elastomer which is permanently bonded to and completely encapsulates a ductile iron valve disc. Interior of valve body shall be coated with a fusion bonded, thermosetting epoxy coating in accordance with AWWA C550, latest revision. Coating shall be holiday free with a minimum thickness of 12 mils. Surfaces shall be clean, dry and free from rust and grease before coating. Exterior surfaces shall be coated as specified hereinafter. Resilient seated type gate valves shall be as manufactured by U.S. Pipe or equal.
3. Valve Joints: All gate valves shall have either mechanical joint, restrained joint or flanged ends to fit the pipe run in which they are to be used. Gate valves installed on push on joint pipe shall have mechanical joint ends unless otherwise specified.
4. Valve Operators: Gate valves shall open left (counter-clockwise) when viewed from the stem. Unless otherwise shown on the Drawings or specified herein, gate valves shall have non-rising stems. Buried gate valves shall be furnished with a 2 inch square AWWA standard nut operator with a valve box and cover. Gate valves located aboveground or inside structures shall be furnished with a handwheel operator which shall have an arrow cast in the metal indicating the direction of opening. Gate valves used as isolation valves for reduced pressure backflow preventers shall be of the open screw and yoke (OS&Y) design with a handwheel operator.
5. Exterior Valve Coatings: All exterior surfaces of iron body gate valves shall be clean, dry and free from rust and grease before coating. For buried service, the exterior ferrous parts of all valves shall be coated at the factory with coal tar epoxy with a minimum total finish dry film thickness of 20 mils. Prior to backfilling, all uncoated units, bolts, glands, rods and other parts of joints shall be coated in the field with coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M. For valves installed aboveground, the exterior ferrous parts of all valves shall be shop primed at the factory with one coat, minimum dry film thickness 1.5 mils, of a primer with rust-inhibitive pigments and synthetic resins. Following installation, aboveground valves shall be finish painted in accordance with manufactures recommendations.

2.08

PINCH CHECK VALVES

- A. Valves are to be of the flow operated check type with flanged joint ends on both check sleeve and metal body. Port areas shall be 100% of the mating pipe port area. The port area shall contour down to a duckbill which shall allow passage of flow in

one direction and prevent reverse flow in the other direction. The flexible duckbill sleeve shall be one piece rubber construction with fabric reinforcement. The flange shall be drilled to ASNI B16.1, Class 125/ANSI B16.5 Class 150 standard. Valve body shall be drilled and tapped for flushing connection on top and bottom of the housing. Valve body shall be two piece split body construction. The two halves shall be sealed by diamond shaped cross section rubber gaskets permanently locked by a groove cast in the valve body. Company name and location shall be cast onto the valve body. The valve shall be designed for a maximum back pressure of 100 psi. The valve shall be red valve series 33 or equal.

- B. Interior Valve Coating: Prior to shipment from the factory, the interior ferrous surfaces of the valve, except for finished, non-ferrous or bearing surfaces, shall be coated with a fusion bonded, thermosetting epoxy coating in accordance with AWWA C550, latest revision. Coating shall be holiday free with a minimum thickness of 12 mils. Surfaces shall be clean, dry and free from rust and grease before coating.
- C. Exterior Valve Coating: All exterior surface of swing check valves shall be clean, dry and free from rust and grease before coating. For valves installed in below ground valve vaults, the exterior ferrous parts of all valves shall be coated at the factory with coal tar epoxy with a minimum total finish dry film thickness of 20 mils. Following installation, all uncoated nuts, bolts, glands, rods and other parts of joints shall be coated in the field with coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M. For valves installed aboveground, the exterior ferrous parts of all valves shall be shop primed at the factory with one coat, minimum dry film thickness 1.5 mils, of a primer with rust-inhibitive pigments and synthetic resins. Following installation aboveground valves shall be finish painted in accordance with manufacturer's recommendations.

2.09 PLUG VALVES

- A. General: Plug valves shall be non-lubricated eccentric type with flanged or mechanical joint ends as specified below. Valves shall open by turning to the left (counter-clockwise), when viewed from the stem. Port area of valves shall be a minimum of 80 percent of full pipe area. Valve pressure ratings, body flanges and wall thicknesses shall be in full conformance with ASNI B16.1, latest revision. Valves shall seal leak-tight against full rated pressure in both directions. Prior to shipment from the factory, each valve shall be hydrostatically tested as follows: Valve seats shall be tested to provide leak tight shut off to 175 psi for valves through 12 inch and 150 psi for valves 14 inches and larger, with pressure in either direction. In addition, a hydrostatic shell test shall be performed with a plug open to a pressure twice that of rating specified above to demonstrate overall pressure integrity of the valve body. Plug valves shall be eccentric plug valves as manufactured by DeZurick, Milliken, or approved equal.
- B. Eccentric Plug Valves: Eccentric plug valves shall be Series 100 as manufactured by DeZurick or equal. Valve bodies shall be constructed of high strength cast iron conforming to ASTM A126, Class B and AWWA C504, latest revisions. Valve bodies shall be cast with raised eccentric seats which have a corrosion resistant welded in overlay of not less than 90 percent pure nickel on all surfaces contacting

the plug face. Valve seats shall be in accordance with AWWA C504 and AWWA C507, latest revisions. Valves shall be furnished with resilient faced plugs with Neoprene facing, suitable for use with sludge. Valves shall be furnished with replaceable, permanently lubricated, stainless steel, sleeve-type bearings in the upper and lower plug stem journals. Plug stem bearings shall comply with AWWA C504 and C507, latest revisions. Valves shall be bolted bonnet design. Valves shaft seals shall be designed so that they can be repacked without removing the bonnet and the packing shall be adjustable. Packing material shall be Buna-Vee type packing. Valve shaft seals shall be in accordance with AWWA C504 and AWWA C507, latest revisions. All exposed valve nuts, bolts, springs, washers and the like shall be Type 304 stainless steel.

- C. Interior Valve Lining: All interior ferrous surfaces of the valve that will have contact with the leachate except the valve seating surfaces shall be coated with a factory applied, fusion bonded, thermosetting epoxy coating in accordance with AWWA C550, latest revisions. Coating shall be holiday free with a minimum thickness of 12 mils. Surfaces shall be clean, dry and free from rust, oil and grease before coating.
- D. Exterior Valve Coating: All exterior surfaces of plug valves shall be clean, dry and free from rust and grease before coating. For buried service, the exterior ferrous parts of all valves shall be coated at the factory with coal tar epoxy with a minimum total finish dry film thickness of 20 mils. Prior to backfilling, all uncoated nuts, bolts, glands, rods and other parts of joints shall be coated in the field with coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M. For valves installed above ground, the exterior ferrous parts of all valves shall be shop primed at the factory with one coat, minimum dry film thickness 1.5 mils, of a primer with rust inhibitive pigments and synthetic resins. Following installation aboveground valves shall be finish painted in accordance with manufacturer's recommendations.
- E. Valve Joints: All plug valves installed aboveground, in valve vaults or on flanged piping shall have flanged ends. Flanges shall comply with facing, drilling and thickness of ANSI Standards for Class 125 dimension. Nuts and bolts for flanged connections in valve vaults or corrosive atmospheres shall be Type 316 stainless steel in accordance with ASTM A320, Class 2. Nuts and bolts for aboveground installations or non-corrosive atmospheres shall be carbon steel in accordance with ASTM A307, Grade B. All buried plug valves shall have mechanical joint ends with dimensions, bolting patterns and assembly in strict accordance with ANSI/AWWA C111, latest revision. Tee head bolts and nuts for mechanical joints shall be manufactured of CORTEN-A, high strength, low alloy, corrosion resistant steel as manufactured by NSS Industries, Plymouth, Michigan or an equal approved by the Engineer.
- F. Mechanical Valve Actuators:
 - 1. All plug valves installed in valve vaults or buried underground shall have actuators designed for buried and submerged service. Valves shall have seals on all shafts and gaskets on valve and actuator covers to prevent entry of water and dirt. Actuator mounting brackets for buried and submerged service shall be totally enclosed and shall have gasket seals. All exposed

valve nuts, bolts, springs, washers and the like shall be Type 304 stainless steel.

2. All plug valves 6 inch in size and larger shall be furnished with mechanical gear actuators. Gear actuators shall be furnished with AWWA Standard 2 inch square operating nuts for buried valves, or handwheel, chainwheel or 2 inch square nut operators for aboveground or valve vault installation, as shown on the Drawings. Gear actuator shall be sized for the maximum pressure differential across the valve, equal to the pressure rating of the valve. All gearing shall be enclosed in a high strength cast iron housing, suitable for running in a lubricant. Housing shall be provided with seals on all shafts to prevent the entry of dirt and water into the actuator. Actuator shaft and quadrant shall be supported on permanently lubricated bronze bearings. Actuator shall clearly indicate valve position for aboveground and valve vault installations and an adjustable stop shall be provided to set closing torque. Actuator shall be capable of withstanding an over-torque without damage up to 450 foot pounds for 2 inch square nut operators and to 300 foot pounds for handwheel or chainwheel operators.
3. Four inch and smaller aboveground valves shall be furnished with manual actuators, one-quarter turn to open. Actuator shall be supplied with an AWWA Standard 2 inch operating nut with a standard valve operating lever.

2.10 BUTTERFLY VALVES

- A. General: All butterfly valves shall be of the tight closing, rubber seat type with rubber seats that are securely fastened to the valve body or disc. No metal to metal seating surfaces will be permitted. Valves shall be bubble tight at rated pressures with flow in either direction, and shall be satisfactory for applications involving throttling service and/or frequent operation and for applications involving valve operation after long periods of inactivity and for buried installation. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. Valves shall meet the full requirements of AWWA Standard C 504 for Class 150B, short body, flanged or mechanical joint as required. Wafer design valves are not acceptable, except when indicated on the Drawings. The manufacturer shall have manufactured tight closing, rubber seat butterfly valves for a period of at least five years. All valves shall be Henry Pratt Company, DeZurik, Mueller, or equal.
- B. Valve Body: Valve bodies shall be constructed of cast iron ASTM A126 Class B or ASTM A48 Class 40. Ends shall be mechanical joint for buried service and flanged for aboveground use. Flange drilling shall be 125 pound in accordance with ANSI B16.1. Two trunnions for shaft bearings shall be integral with each valve body. When disc has the rubber seat, the valve body shall have a 18-8 Type 304 stainless steel body seat. The port diameter shall be no smaller than one inch less than the nominal valve size.
- C. Valve Shaft: The valve shaft may consist of a one piece unit extending completely through the valve unit or may be the "stub shaft" type. Materials to be stainless steel 18-8 Type 304.

- D. Valve Discs: Valve discs shall be constructed either of cast iron ASTM A126 Class B, ductile iron ASTM A536 or cast iron ASTM A48 each with Type 316 stainless steel seating edge or the entire disc may be constructed of cast 316 stainless steel. The stainless steel seating edge is not applicable to rubber seat disc type valves.
- E. Valve Seats: Valve seats shall be of a synthetic or natural rubber compound and any be mounted on the valve body.
- F. Valve Bearings: Valves shall be fitted with sleeve type bearings. Bearings shall be corrosion resistant and self-lubricating.
- G. Valve Packings: Packing shall be self-adjusting Chevron type or of the O-ring type.
- H. Interior and Exterior Valve Coatings: The valve shall be coated similarly as described in Section 2-05 C and D.

2.11 SWING CHECK VALVES

- A. Swing check valves 2-inch through 12-inch in size shall conform to AWWA C-508, latest revision, and shall be designed for a minimum water working pressure of 150 psi. Check valves shall have cast iron body, swing type and ends shall be flanged, Class 125 in accordance with ANSI B16.1. When open, the valve shall have a straight way passage with a minimum flow area equal to the full pipe area. Swing check valves shall be completely bronze fitted with renewable bronze seat ring and a rubber faced disc; valve hinge pin shall be stainless steel. Check valves shall be supplied with an outside lever and weight.
- B. Swing check valves shall absolutely prevent the return of water back through the valve when the inlet pressure decreases below the downstream pressure. The check valve shall be constructed such that the disc and body seat ring may be easily removed and replaced without removing the valve from the line. Each valve shall be hydrostatically tested at the factory, at a test pressure of 300 psi.
- C. Interior Valve Coating: Prior to shipment from the factory, the interior ferrous surfaces of the valve, except for finished, non-ferrous or bearing surfaces, shall be coated with a fusion bonded, thermosetting epoxy coating in accordance with AWWA C-550, latest revision. Coating shall be holiday-free with a minimum thickness of 12 mils. Surfaces shall be clean, dry and free from rust and grease before coating.
- D. Exterior Valve Coating: All exterior surface of swing check valves shall be clean, dry and free from rust and grease before coating. For valves installed in below ground valve vaults, the exterior ferrous parts of all valves shall be coated at the factory with coal tar epoxy with a minimum total finish dry film thickness of 20 mils. Following installation, all uncoated nuts, bolts, glands, rods and other parts of joints shall be coated in the field with coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M. For valves installed aboveground, the exterior ferrous parts of all valves shall be shop primed at the factory with one coat, minimum dry film thickness 1.5 mils, of a primer with rust-inhibitive pigments and synthetic resins.

Following installation aboveground valves shall be finish painted in accordance with manufacturer's recommendations.

- E. All swing check valves shall be provided with a limit switch to indicate valve close position to pump starter, VFD, or control panel.

2.12 SERVICE SADDLES AND CORPORATION STOPS

- A. **Service Saddles:** Service saddles shall have ductile iron bodies in accordance with ASTM A536, latest revision, with double stainless steel straps. Bodies shall be brass or ductile iron, body shall have a fusion bonded nylon coating with a minimum thickness of 12 mils. Straps shall be Type 304 stainless steel with premium grade Type 304 L stainless steel bolts and Type 304 stainless steel washers and nuts. The nuts shall be Teflon coated.
The gasket material shall be an elastomeric compound resistant to degradation by oil, natural gas, acids, alkalies, most aliphatic fluids and leachate. The outlet of the saddle shall have NPT threads. Service saddles shall be Rockwell No. 317, Ford or an equal approved by the Engineer.
- B. **Corporation Stops:** Corporation stops shall be all bronze construction in accordance with AWWA C80, latest revision. Inlet threads shall be NPT iron pipe threads and the outlet connections shall be of the packed joint type suitable for use with Schedule 80 PVC pipe. Corporation stops shall be Ford Ball Corp Type FB 1102, McDonald or an equal approved by the Engineer.
- C. **Polyethylene Tubing.** Service tubing shall be nominal wall polyethylene tubing conforming to the requirements of ASTM D-2737 and AWWA C-901. Tubing shall be manufactured from prime virgin PE-3408 high density polyethylene (HDPE) resin. Each coil of tubing shall be spiral wrapped with four (4) inch wide black .004 polyethylene film with minimum 2% carbon black content to shield the tubing from ultraviolet and violet light. Reclaimed water service tubing shall be lavender in color.
- D. Tubing shall be DR 9.0 CTS OD and supplied in 100 foot rolls. Tubing shall conform to all requirements set forth in AWWA C901. Tubing shall be marked with the following information at not more than 5 foot intervals: nominal size, material code designation, dimension ration and diameter base, AWWA pressure class, AWWA designation and manufacturer's name or trademark and product record code.
- E. Fittings for use with polyethylene (PE) tubing shall be brass containing a pressure sealing O-ring and unidirectional grip ring and shall be designed for "press-on" or "stab-on" installation and manufactured by Ford Meter Box Company.

2.13 SOLENOID VALVES

- A. Solenoid valves shall be 2 way type for normally closed operation designed for not less than a 150 psi water working pressure. The valves shall have forged stainless steel Series 300 bodies for 3/4 inch and smaller and brass bodies for 1 inch and larger with NPT threaded ends, Buna N seals/disks and NEMA 4X Red hat II solenoid enclosures. The valves shall operate on 120 VAC power, shall have threaded conduit hubs, standby manual operators and shall not require a minimum operating pressure differential for standby operation. The valves shall be provided with a manual override. The valves shall be Series 8210G for 3/4 inch and smaller and Series 8221G for one inch and larger as manufactured by Automatic Switch Company or approved equal.

2.14 FLEXIBLE EXPANSION JOINTS

- A. Flexible expansion joints shall be of the molded wide arch design manufactured of chloroprene (neoprene) rubber with polyester reinforcement. Chloroprene (neoprene) body shall be supplied with a hypalon coating. Joints shall be flanged suitable for 150 psi water working pressure and in accordance with ANSI B16.1 dimensions and bolting patterns. Flanged ends shall be furnished and galvanized, split ductile iron retaining rings.
- B. Provide limit restraint bolts on all pump suction and discharge lines. Expansion joints 6 inches and larger in size shall have a minimum of four limit restraint bolts. Restraint bolts and nuts shall be Type 304 stainless steel.
- C. Minimum performance for flexible expansion joints shall be as follows:

Size (in.)	Axial Compression (inches)	Axial Elongation (inches)	Lateral Angular Deflection (inches)	Deflection (degrees)
2	1-3/4	3/4	3/4	30
3	d.o.	d.o.	d.o.	30
4	d.o.	d.o.	d.o.	25
5	d.o.	d.o.	3/4	25
6	d.o.	d.o.	1	20
8	d.o.	d.o.	d.o.	20

- D. Flexible expansion joints shall be Style 1015 Maxi-Joint as manufactured by General Rubber Corporation, Style 100 Metrasphere as manufactured by the Metraflex Company or an equal approved by the Engineer. Flexible joints for pump suction and discharge piping shall be designed for leachate service at 250 degrees F.

2.15 PRESSURE GAUGE ASSEMBLIES

- A. Pressure gauges shall have the following design features: glycerin filled, 2 inch dial, aluminum dial with black numerals on white background, Type 316 stainless steel bourdon tube and movement, 300 series stainless steel case and ring, safety glass lens, threaded lens retaining ring, adjustable pointer with over-pressure stop

and zero pointer stop, blowout protection, 2 inch Type 316 stainless steel stem mounting and 1.0 percent accuracy based on full scale. Provide Type 316 stainless steel pressure snubbers on all gauges not protected by seals. Pressure gauges shall be as manufactured by U.S. Gauge, Ashcroft, Marshalltown, Marsh, or approved equal.

- B. Pressure Gauge Service and Ranges: Pressure gauges shall be furnished for the following services with the indicated ranges. Diaphragm seals shall be furnished for gauges as indicated.

2.16 VALVE BOXES

- A. Furnish, assemble, and place a valve box over the operating nut for each buried valve. The valve box shall be designed so as to prevent the transmission of surface loads directly to the valve or piping.
- B. Valve boxes shall be of the adjustable slide type of suitable length with an interior diameter of not less than 5 inches. The valve boxes shall be manufactured of cast iron and shall be of the two piece design including a bottom section and top section with cover. The cast iron cover shall be shaped and labeled for the appropriate service designation. The top section shall be adjustable for elevation and shall be set to allow equal movement above and below finished grade.
- C. The castings shall be manufactured of clean, even grain, gray cast iron conforming to ASTM A48, Class 30B for Gray Iron Castings; and shall be smooth, true to pattern, free from blow holes, sand holes, projections and other harmful defects. The seating surfaces of both the cover and the top section shall be machined so that the cover will not rock after it has been seated.
- D. The valve boxes shall be coated inside and outside with an asphaltic coating prior to machining, so that the machined seating surfaces will be free of any coating. Cast iron valve box assemblies shall be Clow Corp. No F2452, Tyler Corp. Series 6855 or 6865 or an approved equal.
- E. Valve extension stems shall be provided for all buried valves when operating nut is deeper than 3 feet below final grade.

2.17 PIPE AND VALVE IDENTIFICATION SYSTEMS

- A. Not Included

2.18 GLOBE VALVES AND ANGLE VALVES

- A. Globe valves and angle valves shall be suitable for throttling flows of liquid, oil, gas and air lines. Valves shall have end connections as indicated on the Drawings and shall be suitable for a working pressure of not less than 150 psi.

- B. Each valve shall have self-lubricating TFE-impregnated asbestos packing to provide a tight stem steel. Valves shall have a removable bonnet in order to facilitate dismantling and reassembly of the valves.
- C. Globe valves shall be Crane Model No. 1, Stockham Valves Figures B-16, or equal. Angle valves shall be Crane Model No. 2, Stockham Valves Figure B-216, or equal.

2.19 PRESSURE REGULATING VALVE

- A. Pressure regulating valves shall be of bronze body construction, seat shall be of stainless steel, diaphragm shall be Buna N.
- B. Regulator shall have a maximum pressure limit of 100 psi and the pressure reduction range shall be to 5 psi for all the services except for belt washwater. The maximum and minimum pressure variation range for the belt washwater shall be per gravity belt supplier's recommendations. The regulator shall be a direct acting, spring loaded, diaphragm type for hydraulic operation, and shall be capable of delivering a constant pressure. An adjusting screw shall be easily accessible for changing the outlet pressure.
- C. Valves shall be installed in strict accordance with the manufacturer's recommendations. The manufacturer shall be Watts, or equal.

2.20 TIE RODS

- A. When prior approval is obtained from the Engineer, ductile iron pipe, fittings, and valves may be restrained using tie bolt joint restraint. Joint restraint materials for this method of restraint shall be the Super-Star SST Series Joint Restraint Joint System as manufactured by Star National Products, a Division of Star Industries, Inc., Columbus, Ohio, or an equal approved by the Engineer.
- B. All bolts, nuts, washers, tie rods and other fasteners for the joint restraint system shall be manufactured of CORTEN high strength, low alloy, corrosion resistant steel in conformance with ASTM A242. Tie bolts shall be manufactured of heat treated CORTEN steel. Tie rods and all fasteners for the system shall be galvanized in conformance with the requirements of ASTM A123. Tie rods shall have a minimum diameter of 3/4 inch. The number of tie rods required per joint shall be as recommended by the manufacturer.
- C. Prior to backfilling after installation, all parts of the joint restraint system shall be coated with coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M, for a minimum dry film thickness of 20 mils.

2.21 REDUCED PRESSURE BACKFLOW PREVENTERS

- A. Standards of Construction: Backflow prevention devices shall be manufactured in accordance with AWWA C506, latest revision, American Society of Sanitary Engineering Standards, and the University of Southern California Foundation for

Cross Connection Control and Hydraulic Research "Manual of Cross Connection Control", latest edition.

- B. Product Handling: Exercise care in transporting and handling backflow preventers to avoid damage. Inside of backflow preventers shall be kept free of dirt and debris.
- C. Reduced pressure principle backflow preventers shall include an integral sensing system that will automatically open a relief valve whenever the differential pressure between the inlet supply and the reduced pressure zone drops to 2 psi. The relief valve shall remain open until a positive pressure differential of 2 psi is re-established. If pressure upstream of the first check valve drops to atmospheric or below, the relief valve shall remain fully open providing an internal air gap between the first check valve and the water level in the reduced pressure zone. The unit shall also be constructed such that any minor leakage of the second check valve will result in visible flow from the relief valve, even if the first check valve is totally disabled.
- D. Reduced pressure principle backflow preventers shall have all bronze bodies for sizes 22 inches and smaller and all ductile iron bodies for sizes 3 inches and larger. Ductile iron bodies shall be coated with a fusion bonded thermosetting epoxy coating in accordance with AWWA C550 with a minimum, holiday free, coating thickness of 12 mils. The reduced pressure backflow preventer shall consist of two independently operated, spring loaded, wye pattern, poppet type check valves designed for installation in a normal horizontal flow attitude. An independent spring loaded relief valve shall be located between the two check valves. Check valve assemblies, springs and seats and all other internal parts shall be constructed of Type 316 stainless steel. Relief valve body and trim shall be constructed of bronze. Check valve and relief valve seats shall be field replaceable without removing the device from the service line. Backflow preventers shall be designed for a working pressure of 200 psi and a temperature range of 32EF to 140EF. The backflow preventer shall be manufactured as a complete unit including test cocks, and upstream and downstream isolation valves. The test cocks shall be manufactured of bronze and shall be arranged such that the unit can be tested without removing the unit from the line.
- E. Isolation Valves: Reduced pressure backflow preventers shall be furnished complete with isolation valves. For sizes 22 inches and smaller, the isolation valves shall be all bronze ball valves with Buna N O-rings and valve seats, and a lever operating handle. Ball valves shall be in accordance with AWWA C80, latest revision. For sizes 3 inches and larger, the isolation valves shall be resilient seated gate valves with flanged ends and OS&Y handwheel operators. Gate valves shall be as specified and described hereinbefore.
- F. Exterior Coating: The exterior ferrous surfaces of the reduced pressure backflow preventer and the isolation valves shall be shop primed at the factory with one coat, minimum dry film thickness 1.5 mils, of a primer with rust inhibitive pigments and synthetic resins compatible with the finish coats. Following installation, the backflow preventer unit and aboveground piping shall be finish painted in

accordance with manufacturer's recommendations. All surfaces to be coated shall be clean, dry and free of rust, oil and grease.

- G. Acceptable Manufacturers: Reduced pressure principle backflow preventers shall Model 825 as manufactured by Febco, or an equal approved by the Engineer.

2.22 TAPPING SLEEVES AND VALVES

- A. Tapping sleeves shall be designed for a water working pressure of 150 psi and shall be mechanical joint end type. Tap shall be done under pressure and without interruptions of service. Taps shall be tested at factory to 175 psi.
- B. Tapping valves shall be as specified herein under Gate Valves.
- C. The manufacturer shall furnish the services of a supervisor who will direct all operations for the installation of material, attachment of tapping machine and operation of the machine in making the connection. The Contractors shall bear all such rental and supervision costs, and all other related costs.
- D. Tapping sleeves and valves shall be the product of one of the following manufacturers, or equal: Mueller, Clow, M&H.

2.23 FLANGED ADAPTERS (WHEN APPLICABLE)

- A. For joining plain end or grooved end pipe to flanged pipes and fittings.
- B. Adapters shall conform in size and bolt hole placement to ANSI standards for steel and/or cast iron flanges 125 or 150 pound standard unless otherwise required for connections.
- C. Exposed Sleeve Type:
 - 1. Constructed from steel.
 - 2. Coating: In accordance with manufacturer's recommendations.
 - 3. Bolts: Carbon steel.
 - 4. Acceptable Manufacturers:
 - a. Dresser Manufacturing Company - Style 128 for cast iron ductile iron and steel pipes with diameters of two (2) inches through 96 inches.
 - b. Or equal.

2.24 FIRE HYDRANTS

- A. Hydrants shall comply with AWWA Standard C402 "Fire Hydrants for Ordinary Water Works Service", and shall be equipped with a minimum of one (1) pump outlet nozzle 4 2 inches in diameter and two (2) hose nozzles 2 2 inches in diameter. Threads, nozzle caps, operating nuts and color shall conform to City standards. Units shall be traffic types with breakable safety clips, or flange, and stem, with safety coupling located below barrel break line to preclude valve opening. Hydrants shall be dry top. Outlet nozzles shall be on the same place, with minimum distance of 18 inches from center of nozzles to ground line. Valve shall be compressive type with 52 inches minimum opening and hose inlet connection to be 6 inches minimum. Hydrants shall open left by Mueller A-423 or Clow Medallion Hydrant (AWWA C-502). Hydrants must drain.

2.25 INSERT VALVE

A. General

The Ductile Iron Insert Valve shall be a rated for 250 psig and shall be a Resilient Wedge Gate Valve as specified in this section. The valve shall be able to be installed into an existing pressurized pipeline while maintaining constant pressure and service as usual. After closing the wedge and adequately restraining the valve body the downstream pipe can be completely removed and replaced (allowing for upsizing of the pipe if necessary). The host pipe shall not be a permanent component of the Insert Valve. The Insert Valve shall be UL listed and approved to *NSF / ANSI Standard 61- Drinking Water System Components*. The insert valve must be installed by a qualified installer per the manufacturer's requirements.

- B. **Construction:** Sizes 12" and smaller must be capable of working on Cast/Grey Iron or Ductile Iron Class A, B, C and D, IPS PVC, C900 and C909 PVC, Steel, AC pipe diameters without changing either top or bottom portion of split valve body. The 250 psig maximum working rating markings must be cast into the body of the valve. After the installation of the Insert valve body on to the existing pipe a pressure test of 1.1 times that of the contents shall sustained for 15 minutes. Once the pressure test is affectively achieved the Insert valve body must not be moved in accordance with AWWA Standards. If the Insert valve is moved the pressure test must be completed again. The Insert valve must not be moved or repositioned once the pressure test is achieved.

- C. **Resilient Wedge Gate Assembly:** The construction of the Resilient Wedge shall comply with AWWA C509 requirements. The ductile iron wedge shall be fully encapsulated with EPDM rubber by a high pressure and high temperature compression or injection mold process. This will assure the ductile gate is fully coated with molded rubber – no exposed iron. The resilient wedge shall seat on the valve body and not the pipe to obtain the optimum seating and flow control results. The resilient wedge shall be totally independent of the carrier pipe. The resilient wedge shall not come into contact with the carrier pipe or depend on the carrier pipe to create a seal. Abrasion results thus shorting the life and quality of the shut down if the wedge contacts the pipe. Pressure equalization on the down or upstream side of the closed wedge shall not be necessary to open the valve. The wedge shall be symmetrical and seal equally well with flow in either direction. The Resilient

wedge must ride inside the body channels to maintain wedge alignment throughout its travel to achieve maximum fluid control regardless of high or low flow pressure or velocity. An oversized flow way shall be unobstructed to provide optimum flow. The valve shall be fully epoxy coated on the interior and the exterior a minimum of 10 mils epoxy in compliance with AWWA C550 and certified to ANSI/NSF-61. The fusion-bonded coating shall be applied prior to assembly so that even the bolt holes and body-to-bonnet flange surfaces are fully epoxy coated.

- D. The valve shall have triple O-Ring stem seals, two O-Rings above, and one below the thrust collar. The lower two O-Rings provide a permanently sealed lubrication chamber that will make the valve easier to operate over a longer period of time. The upper O-Ring ensures that sand, dirt or grit cannot enter the valve to cause damage to the lower O-Rings. This is especially important for buried and sewage service applications. Side flange seals shall be of the O-Ring type of either round, oval, or rectangular cross-sectional shape.
- E. American Made Quality: All primary parts and components to be exclusively and completely assembled, manufactured, machined and coated in the USA. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense. Bolting materials shall develop the physical strength requirements of ASTM A307 with dimensions conforming to ANSI B18.2.1.
- F. Split Restraint Devices: Shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10. The devices shall have a working pressure rating of 350 psi for 4-12 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes. Chemical and modularity tests shall be performed as recommended by the Ductile iron Society, on a per ladle basis. Three test bars shall be incrementally poured per production shift as per U.L. specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.
- G. Gland body wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts. Set screw pressure point type hardware shall not be used.

The Insert valve shall be as manufactured by **Team Industrial Services** 13131 Dairy Ashford Rd Sugar land, TX 77478 1-800-662-8326 281-331-6154, Team InsertValve Patent number 6,776,187 and 7,225,827 or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION

- A. All pipe, fittings, valves and other material shall be subject to inspection and approval by the Engineer after delivery, and no broken, cracked, imperfectly coated, or otherwise damaged or unsatisfactory material shall be used.

When a defect or crack is discovered, the injured portion shall not be installed. Cracked pipe shall have the defect cut off at least 12 inches from the break in the sound section of the barrel.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Excavation, backfill, and compaction shall conform to the provisions of Section 31 23 00.
 - 1. Pipe Cradle: Upon satisfactory installation of the pipe bedding material as specified, a continuous trough for the pipe barrel and recesses for the pipe bells or couplings shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure will be exerted on the pipe joints from the trench bottom.
- B. Cover for underground piping shall not be less than that indicated on the Drawings. The minimum cover for pipe shall be 36 inches. In areas where other piping conflicts preclude the maximum cover desired, the piping shall be laid to provide the maximum cover obtainable.
- C. Pipe, fittings, valves and accessories shall be installed as shown or indicated on the Drawings.
- D. All connections to existing piping systems shall be made as shown or indicated on the Drawings after consultation and cooperation with authorities of the Owner.
- E. Pipe Joint Deflection: Whenever it is desirable, and approved by the Engineer, to deflect pipe joints to avoid obstructions or to maintain required alignment, the amount of the joint deflection shall not exceed 80 percent of the maximum limits allowed by the pipe manufacturer.
- F. In preparation for pipe installation, placement (stringing) of pipe should be as close to the trench as practical on the opposite side of the trench from the excavated material. The bell ends of the pipe should point in the direction of the work progress.
- G. Pipe and fittings shall be laid accurately to the lines and grades indicated on Drawings or required. Where grades for the pipeline are not indicated on the Drawings, maintain a uniform depth of cover with respect to finish grade. Care shall be taken to insure a good alignment both horizontally and vertically and to give the pipe a firm bearing along its entire length. Any pipe which has its grade or joint disturbed after laying shall be taken up and re-laid.
- H. All pipe and fittings shall be cleared of sand, dirt, and debris before laying. All precautions shall be taken to prevent sand, dirt or other foreign material from entering the pipe during installation. If necessary, a heavy, tightly woven canvas bag of suitable size shall be placed over each end of the pipe before lowering into the trench and left there until the connection is made to the adjacent pipe. Any

sand, dirt, or other foreign material that enters the pipe shall be removed from the pipe immediately. Interior of all pipe and fittings shall be kept clean after installation until acceptable in the complete work.

- I. Any time that pipe installation is not in progress, the open ends of pipe shall be closed by a watertight plug or other method approved by the Engineer. Plugs shall remain in pipe ends until all water is removed from the trench. No pipe shall be installed when trench conditions are unsuitable for such work, including standing water, excess mud, or rain.
- J. After pipe has been laid, inspected, and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place while conducting the preliminary hydrostatic test. No backfill shall be placed over the joints until the preliminary test is satisfactorily completed, leaving them exposed to view for the detection of visible leaks.
- K. Upon satisfactory completion of the hydrostatic test, backfilling of the trench shall be completed.
- L. Aboveground and Exposed Piping: Piping shall be cut accurately to measurements established at the job site and shall be worked into place without springing or forcing, properly clearing all equipment access areas and openings. Changes in sizes shall be made with appropriate reducing fittings. Pipe connections shall be made in accordance with the details shown and manufacturer's recommendations. Open ends of pipe lines shall be properly capped or plugged during installation to keep dirt and other foreign material out of the system. Pipe supports and hangers shall be provided where indicated or as required to insure adequate support of the piping.

3.03 INSTALLATION OF DUCTILE IRON PIPE

- A. Handling and Cutting Pipe:
 - 1. Care shall be taken in handling, cutting, and laying ductile iron pipe and fittings to avoid damaging the pipe and interior coal tar epoxy or cement mortar lining, scratching or marring machined surfaces, and abrasion of the pipe coating. All cracked pipe and fittings shall be removed at once from the work at no additional cost to the Owner.
 - 2. Pipe cutting shall be done in a neat workmanlike manner without creating damage to the pipe and interior coal tar epoxy or cement mortar lining. Ductile iron pipe may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, milling wheel saw or oxyacetylene torch. Cut ends and rough edges of ductile iron pipe shall be ground smooth. For push-on joint connections, the cut end shall be beveled to prevent gasket damage during joint assembly. Interior lining shall be repaired at cut ends per the manufacturer's instructions prior to joint assembly.

B. Laying Pipe and Fittings:

1. Bedding for Ductile Iron Pipe: Minimum bedding requirements shall be Type 2 as defined in ANSI/AWWA C600, latest revision. Provide proper bedding required, in accordance with thickness class of pipe being laid and depth of cover. Proper pipe laying conditions shall be in accordance with ANSI/AWWA C150 and C151, latest revision, and ANSI/AWWA C600, latest revision.
2. All ductile iron pipe and fittings shall be laid in accordance with American Water Works Association Standard ANSI/AWWA C600, latest revision, entitled "Standard for Installation of Ductile Iron Water Mains and Their Appurtenances", with the following sections specifically applying:
 - a. Section 3.3 - Pipe Installation
 - b. Section 3.4 - Joint Assembly

C. Ductile Iron Pipe Joints:

1. Type: The joints of all pipelines shall be made absolutely tight. The particular joint used shall be approved by the Engineer prior to installation. Where shown on the Drawings or where, in the opinion of the Engineer, settlement or vibration is likely to occur, all pipe joints shall be bolted mechanical type or restrained type as specified above, or as indicated on the Drawings.
2. Push-on Joints: Push-on joints shall be made in strict accordance with the the manufacturer's recommendations. Lubricant, if required, shall be an inert, non-toxic, water soluble compound incapable of harboring, supporting, or culturing bacterial life. Manufacturer's installation recommendations shall be submitted to the Engineer for review and approval before commencing work. The bell of the pipe shall be cleaned of excess tar or other obstructions and wiped out before the cleaned and prepared spigot of the next pipe is inserted. The new pipe shall be shoved firmly into place until properly seated and held securely until the joint has been completed.
3. Mechanical Joint: All types of mechanical joint pipes shall be laid and jointed in full conformance with manufacturer's recommendations, which shall be submitted to the Engineer for review and approval before work is begun. Only skilled workmen shall be permitted to makeup mechanical joints. Torque wrenches, set as specified ion AWWA Standard C111, shall be used; or spanner type wrenches not longer than specified therein may be used without the permission of the Engineer.
4. Flanged Joints: Flanged joints shall be made up by inserting the gasket between the flanges. The threads of the bolts and the faces of the gaskets shall be coated with suitable lubricant immediately before installation.

5. Restrained Joints: Restrained joints shall be provided where indicated on the Drawings. Joint assembly shall be made in strict accordance with the manufacturer's instructions, which shall be submitted to the Engineer for review and approval before commencing work.

3.04 INSTALLATION OF PVC PIPE

A. Storage and Handling:

1. PVC pipe shall be delivered to the site in unbroken bundles packaged in such manner as to provide protection against damage. When possible, pipe should be stored at the job site in the unit packages until ready for use. Packaged units shall be handled using a forklift or a spreader bar with fabric straps. Packaged units shall not be stacked at the job site higher than two units high.
2. When it is necessary to store PVC pipe for long periods of time, exposure to direct sunlight shall be prevented by covering the pipe with an opaque material. Adequate air circulation above and around the pipe shall be provided as required to prevent excessive heat accumulation. PVC pipe shall not be stored close to heat sources of hot objects such as heaters, fires, boiler, or engine exhaust. Pipe gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. The interior and all sealing surfaces of pipe, fittings, and other appurtenances shall be kept clean and free of dirt and foreign matter.
3. Care shall be taken in handling and laying pipe and fittings to avoid severe impact blows, crushing, abrasion damage, gouging or cutting. Pipe shall be lowered, not dropped, from trucks or into trenches. All cracked, damaged, or defective pipe and fittings, or any length of PVC pipe having a gouge, scratch or other permanent indentation of more than 10 percent of the wall thickness in depth, shall be rejected and removed at once from the work and replaced with new acceptable pipe at no additional cost to the Owner.

B. Field Cutting PVC Pipe: Field cutting of pipe shall be done in a neat workmanlike manner without creating damage to the pipe. The pipe shall be cut square with a fine-toothed hand or power saw or other cutter or knife designed for use with plastic pipe. Prior to cutting, the pipe shall be marked around its entire circumference or a square in vise shall be used to ensure the pipe end is cut square. Remove burrs by smoothing edges with a knife, file, or sandpaper.

1. Field Cutting Bell and Spigot PVC Pipe: Bevel the cut end of the pipe using a pipe beveling tool, wood rasp or portable sander to prevent damage to the gasket during joint assembly. A factory finished beveled end should be used as a guide to ensure proper beveling angle and correct depth of bevel. Round off any sharp edges on the leading edge of the bevel with a knife or file.

C. Laying PVC Pipe:

1. Pipe Bedding: Bedding for PVC pipe shall be as specified using granular pipe bedding material.
2. All PVC pipe shall be laid in accordance with the pipe manufacturer's published installation guide, the AWWA Manual of Practice No. M23 "PVC Pipe-Design and Installation" and the Uni-Bell Plastic Pipe Association installation recommendations.

D. PVC Pipe Joint Assembly for Rubber Gasketed Bell and Spigot Pipe:

1. The PVC bell and spigot joint shall be assembled in accordance with the pipe manufacturer's installation instructions. Clean the interior of the bell, the gasket, and the spigot of the pipe to be jointed with a rag to remove any dirt or foreign material before assembling. Inspect the gasket, pipe spigot bevel, gasket groove and sealing surfaces for damage or deformation.
2. Lubricate the spigot end of the pipe with a lubricant supplied or specified by the pipe manufacturer for use with gasketed PVC pipe in potable water systems. The lubricant should be supplied as specified by the pipe manufacturer. After then spigot end is lubricated, it must be kept clean and free of dirt and sand. If dirt and sand adhere to the lubricated end, the spigot must be wiped clean and relubricated.
3. Insert the spigot into the bell so that it contacts the gasket uniformly. Align the pipe sections and push the spigot end into the bell until the manufacturer's reference mark on the spigot is flush with the end of the bell. The pipe should be pushed into the bell using a bar and wood block. The joint shall not be assembled by "stabbing" or swinging the pipe into the bell, nor shall construction machinery be used to push the pipe into the bell.
4. If undue resistance to insertion of the spigot end is encountered or if the reference mark does not reach the flush position, disassemble the joint and check the position of the gasket. If the gasket is twisted or pushed out of its seat, inspect the components, repair or replace damaged items, clean the components and repeat the assembly steps. Be sure the pipe is in proper alignment during assembly. If the gasket was not out of position, check the distance between the spigot end and the reference mark and relocate the mark if it is out of position.

E. PVC Pipe Joint Assembly for Threaded and Solvent Welded Pipe

1. All threaded and solvent welded joints shall be made watertight. All pipe cutting, threading and jointing procedures for threaded and solvent welded PVC pipe joints shall be in strict accordance with the pipe and fitting manufacturer's printed installation instructions. Thread lubricant for threaded joints shall be Teflon tape only.

2. At threaded joints between PVC and metal pipes, the metal side shall contain the socket end and the PVC side the spigot. A metal spigot shall not, under any circumstances, be screwed into a PVC socket.
- F. PVC forcemains underground shall be strapped every 10 feet or spiral wrapped with an insulated green No. 14 gauge copper ground wire for future location. The wire shall be stubbed out at each valve box or manhole.

3.05 FITTING INSTALLATION FOR UNDERGROUND PIPING

- A. The weight of ductile iron fittings shall not be carried by the pipe on which they are installed. The fitting shall be supported by a concrete cradle as shown on the standard details. Concrete used for supports shall have a minimum compressive strength of 3000 psi at 28 days. Concrete for support cradle shall be poured against undisturbed soil.
- B. All glands, clamps, bolts, nuts, studs and other uncoated parts of fitting joints for underground installation shall be coated with two coats, 10 mils DFT per coat, of coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M.

3.06 CONCRETE PIPE ENCASEMENT

- A. Concrete for concrete pipe encasement shall have a minimum strength of 3000 psi at 28 days and encasement shall be constructed in accordance with details shown on the Drawings. Encasement shall be constructed where:
 1. Indicated on the Drawings
 2. The Engineer shall order the pipeline encased.
- B. The points of beginning and ending of concrete pipe encasement shall be not more than 6 inches from a pipe joint to protect the pipe from cracking due to uneven settlement of its foundation or the effects of superimposed live loads. Pipe shall be wrapped in visqueen.
- C. Pipe encasement shall provide a minimum coverage of 6 inches all around the pipe including pipe bells.

3.07 INSTALLATION OF PIPE SLEEVES, WALL CASTINGS AND COUPLINGS

- A. Pipe sleeves and wall castings shall be provided at the locations called for on the Drawings. These units shall be as detailed and of the material as noted on the Drawings. They shall be accurately set in the concrete or masonry to the elevations shown. All wall sleeves and castings required in the walls shall be in place when

the walls are poured. Ends of all wall castings and wall sleeves shall be of a type consistent with the piping to be connected to them.

- B. Link seals for wall sleeves shall be installed in strict accordance with the manufacturer's printed installation instructions. For watertight applications in tanks or treatment units, the link seal installation shall be tested hydrostatically for leaks at the same time as the tank or treatment unit. Any leaks that occur during the test period shall be repaired by checking the link seals for proper installation and replacement of unit(s) found to be defective at no additional cost to the Owner.
- C. Pipe couplings shall be installed in strict accordance with the manufacturer's published instructions and recommendations.

3.08 INSTALLATION OF VALVES

- A. Valves of the size and type shown on the Drawings shall be set plumb and installed at the locations indicated on the Drawings. Valves shall be installed in accordance with manufacturer's installation instructions and with the Details shown on the Drawings.
- B. Valves shall be installed such that they are supported properly in their respective positions, free from distortion and strain. Valves shall be installed such that their weight is not borne by pumps and equipment that are not designed to support the weight of the valve.
- C. Valves shall be carefully inspected during installation; they shall be opened wide and then tightly closed and the various nuts and bolts shall be tested for tightness. Special care shall be taken to prevent any foreign matter from becoming lodged in the valve seat. Check and adjust all valves for smooth operation.
- D. Install valves with the operating stem in either horizontal or vertical position.
- E. Allow sufficient clearance around the valve operator for proper operation.
- F. Clean iron flanges by wire brushing before installing flanged valves. Clean carbon steel flange bolts and nuts by wire brushing, lubricate threads with oil or graphite, and tighten nuts uniformly and progressively. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.
- G. For buried valves, a valve box shall be centered accurately over the operating nut and the entire assembly shall be plumb. The tops of valve boxes shall be adjusted to the proper elevation as specified below and as shown on the Drawings.
 - 1. In paved areas, tops of valve box covers shall be set flush with pavement. Following paving operations, a 16 inch square shall be neatly cut in the pavement around the box and the paving removed. The top of the box shall then be adjusted to the proper elevation and a 30 inch square by 6 inch thick

concrete pad poured around the box cover. Concrete pads in traffic areas shall be reinforced with No. 4 reinforcement bars as shown on the Drawings. Concrete for the pad shall be 3000 psi compressive strength.

2. In unpaved areas, tops of valve box covers shall be set 2 inches above finished grade. After the top of the box is set to the proper elevation, a 16 inch square by 6 inch thick concrete pad shall be poured around the box cover. Concrete for the pad shall be 3000 psi compressive strength.

- H. Valves shall be tested hydrostatically, concurrently with the pipeline in which they are installed. Protect or isolate any parts of valves, operators, or control and instrumentation system whose pressure rating is less than the pressure test(s). If valve joints leak during pressure testing, loosen or remove the nuts and bolts, reseal or replace the gasket, reinstall or retighten the bolts and nuts and hydrostatically retest the joints.
- I. Following installation, all aboveground valves shall be painted in accordance with the painting system specified in accordance with manufacturer's recommendations. Following installation of buried valves or valves installed in valve vaults, repair any scratches, marks and other types of surface damage, etc., with a coating equal to the original coating supplied by the manufacturer. Prior to backfilling, all nuts, bolts and other parts of the valve joints shall be coated with two coats, 10 mils DFT per coat, of coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M.

3.09 SEPARATION OF NON-POTABLE WATER MAINS AND POTABLE WATER MAINS

- A. Reclaimed water mains shall be installed with at least a 3 foot horizontal separation from any potable water main. Force mains and gravity sewers shall have a 6 foot separation from potable mains. At crossings the installation shall provide of a minimum vertical separation distance of 12 inches between the outside of the crossing non-potable and potable water mains. This separation shall be provided where the potable water main is either below or above the non-potable water main. When the 12 inch minimum vertical separation distance cannot be maintained, the potable water main shall be encased in concrete. Concrete encasement shall be as specified above. The potable water main shall be encased for 10 feet each way of the crossing.

3.10 MAIN CLEANING AND FLUSHING

- A. Following the hydrostatic and leakage tests, all the mains constructed under this contract shall be cleaned and flushed to remove sand, loose dirt and other debris. Flushing velocity shall be a minimum of 2.5 fps. Flushing shall continue until clean water flows from the main. However, the Contractor shall endeavor to use the minimum amount of flushing water required to complete the work. To increase the efficiency of the cleaning and flushing operation, the Contractor shall use a pipeline pigging device of the proper size and designed to clean the intended pipeline. The pigging device shall be capable of turning through a standard 90 degree MJ bend.

The type of pipeline pigging device and the method of operation shall be approved by the Engineer.

- B. Upon completion of testing for the gravity drain line system, drain lines shall be flushed to remove dirt, sand, stones and other debris which may have entered the lines during construction and settled out in the lines and manholes. Materials and debris flushed from the drain lines shall be removed from a downstream manhole or basin and disposed of at an approved disposal area.
- C. Water for flushing shall be clean water provided by the Contractor from a source approved by the Engineer and the owner prior to beginning connections for flushing operations. Flushing shall only be completed upon approval by the Owner.
- D. Temporary blow offs may be required for the purpose of flushing mains. Temporary blow offs shall be installed as close as possible to the ends of the main being flushed. Blow offs installed on the main shall be the same diameter as the main. Temporary blow offs shall be removed and plugged after the main is flushed. All costs for installing and removing temporary blow offs shall be at an additional cost to the Owner.
- E. The Owner shall be notified at least 3 working days prior to flushing mains.
- F. Blow offs and temporary drainage piping used for flushing shall not be discharged into any gravity sewer or pumping station wetwell. The Contractor shall obtain prior approvals from the Engineer and the Owner as to the methods and locations of flushing water discharge.

3.11 INSTALLATION OF TIE RODS

- A. Tie rods shall be installed in strict accordance with the manufacturer's written installation requirements. Unless otherwise indicated on the Drawings, the size and number of tie rods for a joint or installation shall be as recommended by the manufacturer's design chart for a working pressure of 150 psi.
- B. Following installation and prior to backfilling, all parts of the tie rod joint restraint system, including tie rods, tie bolts, nuts, washers, and other fasteners, shall be coated with two coats, 10 mils DFT per coat, of coal tar epoxy equal to Kop-Coat Bitumastic No. 300-M.

3.12 INSTALLATION OF REDUCED PRESSURE BACKFLOW PREVENTERS

- A. Backflow preventers shall be installed at the locations shown on the Drawings. Backflow preventers shall be installed in accordance with the manufacturer's written installation instructions and as shown on the Drawings.
- B. Reduced pressure principle backflow preventers shall be installed horizontally with an 18 inch minimum clearance between the finished grade and the lowest point on the bottom of the unit. Reduced pressure backflow preventers shall be installed with provisions for a suitable drain arrangement to drain off discharges from the

relief valve, so that discharges are not objectionable. Backflow preventers shall be installed such that they are easily accessible for testing, maintenance and repair.

- C. Piping and fittings for units 3 inches and larger in size shall have flanged joints. Piping, fittings and valves shall be properly supported with pipe support stands as shown on the Drawings.
- D. Following installation of the reduced pressure backflow preventer, piping, fittings and valves, the entire aboveground assembly shall be finished painted in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 33 01 30.83
WETWELL LINING SYSTEMS

PART 1 – GENERAL

1.01 SITE ACCESS

- A. Accessibility to the master lift station shall be the responsibility of the CONTRACTOR, and all expenses associated with work site accessibility should be taken into consideration as part of the CONTRACTOR's bid preparation. Damage to existing pavement surfaces and base courses, and/or other surface improvements, as a result of the CONTRACTOR's activities, shall be restored to like-new condition by the CONTRACTOR at his sole expense. The CONTRACTOR shall implement all required measures to provide the OWNER's personnel and equipment with complete access to all work site areas during the entire course of performing this project.

1.02 SCOPE OF WORK

- A. The major elements of the proposed project work are summarized as follows: furnish all labor, materials, and equipment necessary to rehabilitate the interior surface areas of an existing sewer lift station structure using a structural composite liner system. The composite liner system shall consist of both a high strength structural cementitious build-up layer and a corrosion resistant 100 percent (100%) solids epoxy coating system. The work includes mobilization, bypass pumping (as Additional Pricing), removal of any existing deteriorated coating, preparation of lift station structure to be lined, furnishing and applying the specified cementitious and epoxy coating materials to the interior surface areas of the lift station, applicable QA/QC testing, clean-up, and demobilization.

1.03 INSPECTION OF THE WORK

- A. The ENGINEER will provide construction observation services to monitor project quality and determine conformance of the work with the specifications. Each step of the work described herein is subject to inspection and approval by the ENGINEER prior to proceeding with subsequent phases of the work.

1.04 MATERIALS AND EQUIPMENT

- A. All materials, equipment, and types of construction shall be in accordance with these Technical Specifications and shall conform to the requirements of all applicable laws, ordinances, and codes.

- B. All materials and equipment to be incorporated into the work shall be new, unused, and properly designed for the use intended. Materials and/or equipment which, in the opinion of the ENGINEER are inferior or of a lower grade than specified, or required, will not be accepted and shall be removed immediately from the project site.

1.05 EQUIVALENT PRODUCTS AND MATERIALS

- A. If “Or Equal” products are allowed herein, then all material or equipment submitted for consideration as “Or Equal” to that specified must include sufficient written information and data to demonstrate that the material or equipment conforms to the Contract Document requirements. The ENGINEER shall be the sole judge as to whether or not such material or equipment is equal to that specified or required herein.
- B. Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Contract, the CONTRACTOR shall furnish the specified material or equipment at no additional cost to the OWNER.
- C. Neither the approval by the ENGINEER of any alternate material or equipment as being equivalent to that specified, nor the furnishing of the material or equipment specified, shall in any way relieve the CONTRACTOR of responsibility for failure of the material or equipment, due to faulty design, material, or workmanship, to perform the functions required by the Contract Documents.

1.06 MATERIAL AND EQUIPMENT DELIVERY AND STORAGE

- A. The CONTRACTOR shall deliver materials in sufficient quantities to ensure the most timely and uninterrupted progress of the work. All materials and equipment shall be stored in strict accordance with the manufacturer’s recommendations. Products shall also be stored and handled according to their Material Safety Data Sheets (MSDS).

1.07 SPILL OR DISCHARGE OF WASTEWATER

- A. The discharge of wastewater into the environment is prohibited. All spills or discharges of wastewater shall be immediately reported to the ENGINEER, the OWNER, and the F.D.E.P. The CONTRACTOR also shall immediately control, contain, and stop the spill or discharge and shall repair any damage at no additional cost to the OWNER.
- B. The CONTRACTOR is solely responsible for all fines and labor, materials, and equipment costs incurred by the OWNER for wastewater spills or discharges to the environment resulting from the CONTRACTOR’s actions or the CONTRACTOR’s negligence.

1.08 TECHNICAL REFERENCES

- A. ASTM – The published standards of the American Society for Testing and Materials, West Conshohocken, PA.
- B. NACE – The published standards of National Association of Corrosion Engineers (NACE International), Houston, TX.
- C. SSPC – The published standards of the Society of Protective Coatings, Pittsburgh, PA.
- D. Los Angeles County Sanitation District – Evaluation of Protective Coatings for Concrete.
- E. ASTM C 109 – Compressive Strength of Hydraulic Cement Mortars.
- F. ASTM C 293 – Flexural Strength of Concrete.
- G. ASTM C 321 – Bond Strength of Chemical Resistant Mortars.
- H. ASTM C 666 – Resistance of Concrete to Rapid Freezing/Thawing.
- I. ASTM C 596 – Drying Shrinkage of Mortar Containing Cement.
- J. AASHTO –T277 – Rapid Chloride Permeability of Cement.
- K. ASTM C 1244 – Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test.
- L. ASTM D 638 – Tensile Properties of Plastics.
- M. ASTM D 790 – Flexural Properties of Unreinforced and Reinforced Plastics.
- N. ASTM D 695 – Compressive Properties of Rigid Plastics.
- O. ASTM D 4541 – Pull-off Strength of Coatings Using a Portable Adhesion Tester.
- P. ASTM D 2584 – Volatile Matter Content.
- Q. ASTM D 2240 – Durometer Hardness, Type D.
- R. ASTM D 543 – Resistance of Plastics to Chemical Reagents.
- S. ASTM C 109 – Compressive Strength Hydraulic Cement Mortars.

- T. ACI 506.2-77 – Specifications for Materials, Proportioning, and Application of Shotcrete.
- U. ASTM C 579 – Compressive Strength of Chemically Setting Silicate and Silica Chemical Resistant Mortars.
- V. NACE 6/SSPC SP13 – Joint Surface Preparation Standard - Surface Preparation of Concrete.

1.09 SUBMITTALS

A. Product Data.

- 1. Technical data sheet on each product proposed to be furnished demonstrating compliance with these specifications including independent ASTM test results indicating the product conforms to the published technical data.
- 2. MSDS for each product proposed to be furnished.

B. Application Guidelines.

- 1. Project specific guidelines and recommendations.
- 2. Proof of any required federal, state or local permits or licenses necessary for the project.
- 3. Design details for any ancillary systems and equipment to be used in site and surface preparation, application, and testing.
- 4. Written warranty.

C. Certifications.

- 1. Submit all Applicator Qualifications specified in Part 1.10 A.

D. “Or Equal” Submittal. In order to be considered as an equal product, said product will have to meet the minimum physical properties of the approved products as referenced in Paragraph 2.4 as measured by the applicable ASTM standards referenced in Paragraph 1.8. Testing results must be performed and presented by a third-party testing laboratory.

E. “Or Equal” products shall be submitted to the ENGINEER a minimum of two (2) weeks prior to bid date. In order for a product to be considered “equal” the submitted product must receive written approval via addendum to the current bid documents prior to the bid date. Only applicators that have been trained and

certified by the approved liner system manufacturers are allowed to install the structural liner system specified herein.

1.10 QUALITY ASSURANCE

A. Applicator Qualifications.

1. Manufacturer certification that Applicator has been trained and approved in the handling, mixing, and application of the products to be used.
2. Certification that the equipment to be used for applying the products has been manufactured or approved by the cement or epoxy coating manufacturer and Applicator personnel have been trained and certified for proper use of the equipment.
3. Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM, NACE, and SSPC standards and both the cementitious and epoxy material manufacturer's recommendations.
4. The installer/applicator shall submit a list of at least five (5) project references including project name, location, work performed, contract amount, completion date, contact person and phone number, and where similar work as specified herein has been performed.

1.11 WARRANTY

- ### A.
- The Applicator shall warrant all work against defects in materials and workmanship for a period of one (1) year, unless otherwise noted, from the date of final acceptance of the project. Applicator shall, within a reasonable time after receipt of written notice thereof, repair defects in materials or workmanship which may develop during said one (1) year period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without additional cost to the OWNER.

PART 2 – LIFT STATION SURFACE CONDITION ASSESSMENT

2.01 QUALIFICATION OF APPLICABLE SURFACE REPAIR

- ### A.
- The existing substrate of the master lift station to be rehabilitated under this project has been subjected to harsh biogenic hydrogen sulfide corrosion during its operational lifetime. It is anticipated that the depth of this corrosive attack and resulting degradation will likely vary by surface region throughout the interior walls, floor, and ceiling of the structure. In consideration of this variance in surface deterioration, the CONTRACTOR, in conjunction with the OWNER will conduct a surface area analysis of the existing substrate areas prior to

commencement of any lining application. Surface areas will be classified based on the following condition assessments.

1. Condition I Surface Areas.
 - a. The surface area, once cleaned and abraded, has experienced only minor biogenic corrosion to the host substrate, and deteriorated areas do not appear to compromise the load bearing integrity of the surface area. The surface loss in the Condition I areas should not exceed one inch (1.0").
2. Condition II Surface Areas.
 - a. The surface area, once cleaned and abraded, may exhibit corrosion as evidenced in Condition I, but also has some areas with moderate to severe deterioration. Degradation may include signs of initial structural fatigue; however, the existing surface area should be sufficient to sustain and support both soil and live loading. The surface loss in the Condition II areas should not exceed one and a half inches (1.5").

2.02 APPROPRIATE CONDITION BASED REPAIR METHODS

- A. Subsequent to the aforementioned condition assessment, the CONTRACTOR will execute the application of the appropriate condition based repair method. The appropriate repair method shall be based on the following minimum design.
 1. All surface areas identified as Condition I shall receive application of the specified calcium aluminate cementitious structural build-back material at a minimum thickness of one inch (1.0").
 2. All surface areas identified as Condition II shall receive application of the specified calcium aluminate cementitious structural build-back material at a minimum thickness of one and a half inches (1.5").
 3. All interior surface areas, regardless of area condition assessment, will receive an application of the approved epoxy coating material at a minimum uniform thickness of 150 mils.

PART 3 – PRODUCTS

3.01 EXISTING PRODUCTS

- A. Cementitious patching and repair materials shall not be used unless proof of suitability and compatibility with the herein approved cementitious and epoxy materials is provided in writing by the cementitious and epoxy material

manufacturers. Project specific submittals should be provided including application, cure time, and surface preparation procedures that permit optimum bond strength with the epoxy coating.

- B. Remove existing coatings prior to application of the new cementitious lining and/or epoxy coating. Applicator is to maintain strict adherence to all manufacturer's recommendations with regard to proper surface preparation and compatibility with existing coatings.

3.02 CEMENTITIOUS & EPOXY COATING MANUFACTURERS

- A. Quadex, Inc., 1 Country Club Circle, Maumelle, AR (888)-831-1650 or (501) 803-9400 or FAX (501) 803- 9444, or ENGINEER approved equal.
- B. Raven Lining Systems, Inc., Tulsa, Oklahoma (800)-324-2810 or (918)-584-2810 or FAX (918)-582-4311, or ENGINEER approved equal.

3.03 REPAIR MATERIALS

- A. Patching and infiltration control repair materials shall be used to fill voids, structurally reinforce, and/or rebuild surfaces, etc. as determined necessary by the OWNER and CONTRACTOR. Repair materials must be compatible for use with the specified cement and/or epoxy system and shall be applied in accordance with the manufacturer's recommendations.
- B. The following products may be accepted and approved as compatible repair and infiltration materials for use within the specifications:
 - 1. Infiltration Control.
 - a. All fast setting infiltration control materials furnished shall be designed to be applied in dry powder form, with no prior mixing of water, directly to active leaks under hydrostatic pressure in manholes or related structures. Materials shall consist of rapid setting cements, siliceous aggregates, and various accelerating agents. Material shall not contain chlorides, gypsum, or metallic particles.
 - 2. Invert Repair and Patching.
 - a. All material furnished shall be designed to fill voids and to repair or reconstruct where no hydrostatic pressure exists. Material shall consist of rapid setting cements, high density non-absorptive aggregates, and various accelerating agents. Material shall not contain chlorides, gypsum, or metallic particles.

3. Structural Cementitious Liner Material.

- a. Material shall consist of a one component, fiber reinforced, fused calcium aluminate mortar, enhanced with a high density, chemically stable monocrystalline quartz aggregate.

4. Epoxy Coating Material.

- a. Material shall consist of a 100 percent (100%) solid, solvent-free two (2)-component epoxy resin system that is thixotropic in nature and filled with select fillers to minimize permeability and provide sag resistance.

Product Type	Amine Cured Epoxy
Color	Light Blue
Solids Content (% volume)	100
Mix Ratio	Three to One (3:1)
Compressive Strength (psi)	18,000
Tensile Strength (psi)	7,600
Tensile Elongation (%)	One and a Half (1.5)
Flexural Strength (psi)	13,000
Hardness, Type D	88
Bond Strength – Concrete	>Tensile Strength of Concrete
Chemical Resistance	
Severe Municipal Sewer	All Types of Service

3.04 CEMENTITIOUS LINING APPLICATION EQUIPMENT

- A. Only manufacturer approved low-velocity cementitious wet spray system shall be used in the application of the specified cementitious liner material. System shall consist of a batch style mixer, progressive cavity (rotor/stator) style mortar pump, and low-velocity spray nozzle. No gunite applications will be allowed.

3.05 EPOXY COATING APPLICATION EQUIPMENT

- A. Only manufacturer approved heated plural component spray equipment shall be used in the application of the specified epoxy coating. No hand or brush application of the epoxy materials will be allowed.

PART 4 – EXECUTION

4.01 APPLICATOR QUALIFICATIONS

- A. Repair material applicators shall be trained to properly apply the cementitious mortar according to manufacturer's recommendations.
- B. All cementitious and epoxy materials must be applied by a Certified Applicator of the product manufacturer and according to manufacturer specifications.

4.02 SURFACE PREPARATION

- A. Applicator shall inspect all specified surfaces prior to surface preparation. Applicator shall notify OWNER of any noticeable disparity in the surfaces that may interfere with the proper preparation or application of the specified repair materials.
- B. Applicator personnel shall directly perform all aspects of surface preparation and shall not subcontract any element of surface preparation.
- C. All contaminants including: oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed. All concrete or mortar that is not sound or has been damaged by chemical exposure shall be removed to a sound concrete surface or replaced.
- D. Surface preparation method(s) should be based upon the conditions of the substrate, service environment and the requirements of the appropriate condition based repair method to be applied. Surfaces to receive repair materials shall be cleaned and abraded to produce a sound surface with adequate profile and porosity to provide a strong bond between the repair materials and the substrate.
- E. Infiltration shall be stopped by using a material that is compatible with the appropriate and selected condition based repair method. All costs associated with minor infiltration control shall be considered inclusive with the cost of the application of the appropriate cement and/or epoxy application. Moderate to severe infiltration control may require the use of chemical injection grouting. If warranted, chemical injection grouting will involve a separate Payment item based of the contract unit price bid in the Itemized Proposal for each grouting application.

- F. All surfaces shall be examined by the Inspector both during and after preparation and before the repair material is applied.

4.03 APPLICATION OF CEMENTITIOUS LINER MATERIAL

- A. For each bag of product, use the amount of water required per manufacturer's recommendations following mixing procedures noted on product container and using the approved equipment for mixing and material application. The cementitious liner material will require only the addition of potable water during mixing. No other materials will be added during the mixing process without prior written consent from the material manufacturer.
- B. Once materials have been mixed to an appropriate consistency, caution should be taken as to not over mix the mortar material.
- C. The surface prior to application of the cementitious liner shall be clean and free of all foreign material and shall be damp without noticeable free water droplets or running water, but totally saturated just prior to application of the liner material. No application shall be made to a dry surface.
- D. The material shall be spray applied in a consistent manner to create a minimum uniform thickness per appropriate surface area condition assessment.
- E. Troweling of the liner material shall begin immediately following the spray voids in the manhole wall, and creating a relatively smooth finish on the surface of the liner material. Precautions should be taken not to over-trowel the material.
- F. Immediately upon completion of the troweling phase, a wet-brush finish shall be applied to all surface areas of the cementitious liner material.
- G. The cementitious liner material shall be cured in accordance with ACI recommendations. A water based curing compound may be used when necessary.
- H. The liner material, once placed, shall have a minimum of eight (8) hours cure time before being subjected to active flow of surcharge.
- I. In high traffic areas, the manhole should be barricaded and traffic withheld for a minimum of 12 hours after application is complete.
- J. Caution should be taken to minimize exposure of applied product to sunlight and air movement. If application of additional materials is to be longer than 15 minutes, the structure shall be covered. At no time, should the finished product be exposed to sunlight or air movement for longer than 15 minutes before covering or closing access. In extremely hot and arid climates, the manhole shall be shaded while reconstruction is in process. In environments where humidity level is below

70 percent (70%), it shall be necessary to keep finished product damp for the first 72 hours.

- K. No application shall be made to frozen surfaces or if freezing is expected to occur within the substrate within 24 hours after the application. Precautions shall be taken to keep the mix temperature at time of the application below 90°F. Mix water temperature shall not exceed 80°F. Mix water may be chilled with ice if necessary.
- L. Payment will be made on the basis of the contract unit price bid in the Itemized Proposal for each square foot of cementitious build-back that is installed.

4.04 APPLICATION OF EPOXY COATING

- A. Application procedures shall conform to the recommendations of the epoxy coating manufacturer, including material handling, mixing, and environmental controls during application, safety, and spray equipment.
- B. The spray equipment shall be specifically designed to accurately ratio and apply the specified epoxy coating materials and shall be regularly maintained and in proper working order.
- C. Testing for soundness of substrate: upon completion of initial surface preparation, Applicator shall make a visual examination of the surfaces that were prepared to identify areas requiring additional preparation. A screwdriver shall be used to scratch the surface. Should the screwdriver easily remove or dig into any portion of the surface, further preparation shall be required. Retest until a screwdriver cannot scratch the surface.
- D. Testing for contaminants: a water drop test shall be used to test the surface for the presence of hydrophobic contaminants. Applicator shall place a drop of water on the surface in at least four representative locations in the manhole and its wetting behavior shall be observed. If the water droplet flattens out and “wets out” the surface, it is likely the surface is not contaminated. If the water droplet beads up and does not “wet out” the surface, it is likely the surface is contaminated. To remove hydrophobic contaminants the Applicator shall either add an epoxy coating manufacturer approved degreaser to the water blasting process and rewash the interior of the manhole, or utilize another process such as steam cleaning, sodium bicarbonate injection, or abrasive blasting for removal of the contaminants. If contaminants are found and removed, retest the contaminated areas using the water drop test until the contaminants are gone.
- E. Ambient conditions: Applicator shall record air temperature inside the manhole and prevailing weather conditions at the time of coating application.

- F. Specified and properly prepared surfaces shall be coated by roller or spray application of a moisture tolerant, solvent-free, 100 percent (100%) solid, epoxy primer as further described herein. Application shall cover all specified surfaces to a minimum dry film thickness of 150 mils.
- G. During application, Applicator shall regularly perform and record epoxy coating thickness readings with a wet film thickness gage, such as those available through Paul N. Gardner Company, Inc. meeting ASTM D 4414 – Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, to ensure uniform thickness during application.
- H. Top coating or additional coats of the epoxy coating should occur as soon as the prior coat becomes tack free, but no later than the recoat window for the specified products (24 hours). Additional surface preparation procedures will be required if this recoat window is exceeded.
- I. Installation of the epoxy coating shall not commence until the concrete substrate has properly cured in accordance with these specifications.
- J. Payment will be made on the basis of the contract unit price bid in the Itemized Proposal for each square foot of manhole epoxy application.

PART 5 – ANCILLARY LIFT STATION REPAIR ITEMS

5.01 BYPASS PUMPING

- A. If warranted to facilitate any aspect of the manhole or lift station restoration process, the CONTRACTOR shall provide a bypass pumping system that is capable of handling a minimum flow of 200 GPM at 80 psi. The CONTRACTOR shall also provide a secondary or standby pump system that is capable of handling similar flows in the event that the primary pump system experiences flows greater than 200 GPM, or if the first pump fails. Both pumping units shall be provided with the following items: sound reduction compartments, floatation sensors, automatic dialers, and internal and external check valve assemblies.
- B. Any requirement for bypass pumping shall be submitted by the CONTRACTOR to the ENGINEER for review and approval prior to commencement of actual sewer bypass. The ENGINEER shall have sole discretion in determining the necessity for any bypass pumping. No bypass pumping shall be executed without prior approval of the ENGINEER.
- C. Payment will be made on the basis of the contract unit price bid in the Itemized Proposal for any specific structure that requires bypass pumping. Payments for manhole bypass pumping will be limited to one installment per manhole. Any subsequent or additionally required bypass pumping will be at the sole responsibility and expense of the CONTRACTOR.

PART 6 – INSPECTION AND PERFORMANCE TESTING

6.01 PROTECTIVE LINER INSPECTION

- A. After the specified repair and rehabilitation work has been completed, the lift station shall be visually reviewed and tested by the CONTRACTOR in the presence of the OWNER. Visual review shall be for water tightness against leakage of water into the structure. All visible leaks and defects observed during the review shall be repaired to the OWNER's satisfaction. There shall be no visible infiltration.

6.02 PROTECTIVE LINER PERFORMANCE TESTING

- A. In addition to the visual inspection, will be subjected to the following in-field performance testing requirements as a prerequisite for CONTRACTOR payment.
- B. All equipment, materials, and work associated with the prescribed performance testing requirements shall be at the sole expense of the CONTRACTOR.

6.03 EPOXY COATING SPARK TESTING

- A. The epoxy coating shall be tested using a holiday or spark test method to identify any pinholes or holidays that were not detected during the visual inspection.
- B. The CONTRACTOR shall perform holiday detection on all surfaces coated with the epoxy coating in the presence of Inspector.
- C. After the epoxy coating has set hard to the touch, surfaces shall first be dried; an induced holiday shall then be made on to the coated concrete surface and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays at that particular area.
- D. The spark tester shall be initially set at 100 volts per one (1) mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (ref. NACE RPO188-99).
- E. All detected holidays shall be marked and repaired by abrading the coating surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional epoxy coating material can be hand applied to the repair area. All touch-up/repair procedures shall follow the epoxy coating manufacturer's recommendations.

END OF SECTION

SECTION 33 05 19
DUCTILE IRON UTILITY PIPE

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section includes furnishing and installing buried pressure piping systems.

B. RELATED WORK DESCRIBED ELSEWHERE:

1. Section 31 23 00: Excavation and Fill

1.02 QUALITY ASSURANCE

A. Pipe fittings and components shall be manufactured in the USA in accordance with the listed standards and requirements of this specification.

1.03 SUBMITTALS

A. Provide manufacturer's Certificate of Compliance with specified requirements.

1.04 HANDLING AND STORAGE

A. All pipe, fittings, and accessories shall be loaded and unloaded by lifting with hoists or skidding in order to avoid shock or damage. Under no circumstances shall such material be dropped. Pipe handled on skidways shall not be rolled or skidded against pipe on the ground. Slings, hooks or pipe tongs shall be padded and used in such a manner as to prevent damage to the exterior surface or internal lining of the pipes.

B. Materials, if stored, shall be kept safe from damage. Pipe to be used for potable water service shall be stored so as to prevent contamination by animals and their wastes. The interior of all pipe and fittings shall be kept free from dirt or foreign matter at all times.

C. Pipe shall not be stacked higher than the limits shown in the tables in AWWA C600. The bottom tiers shall be kept off the ground on timbers, rails, or concrete. Pipe in tiers shall be alternated: bell, plain end, bell, plain end.

D. At least two rows of 4-inch x 4-inch timbers shall be placed between tiers and chocks affixed to each end in order to prevent movement.

- E. Gaskets for joints shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis. Joint bolts shall be handled and stored in a manner that will ensure proper use with respect to types and sizes.

PART 2 - MATERIALS AND EQUIPMENT

2.01 DUCTILE-IRON PIPE

- A. Pipe for Trench Installation. Pipe for pressure service to be installed in trenches shall be ductile-iron designed in accordance with ANSI/AWWA C150/A21.50. Pipe shall conform to the requirements of ANSI/AWWA C151/A21.51. Pipe shall have push-on joints conforming to the requirements of ANSI/AWWA C111/A21.15. Pipe Pressure Class and Trench Type shall conform with the following:

BURIED DUCTILE-IRON PIPING

<u>Pipe Size</u>	<u>Trench Type</u>	<u>Pressure Class</u>
3-12	2	350
14-20	2	250
24	2	200
30-64	2	150

1. If mechanical joint pipe is furnished, the minimum acceptable pipe class shall be Class 51.
- B. Pipe for Installation on Supports. Pipe for pressure service to be installed on supports shall be flanged ductile-iron piping conforming to the requirements of ANSI/AWWA C115/A21.15 with a minimum thickness of Class 53. Flanges shall be ductile-iron.
1. Only pipe that is of domestic (USA) manufacture will be acceptable.

2.02 FITTINGS

- A. Fittings 3-inch through 24-inch diameter may be ductile-iron fittings conforming to the requirements of ANSI/AWWA C153/A21.53 or cast iron fittings conforming to the requirements of ANSI/AWWA C110/A21.10.
- B. Fittings 30-inch through 48-inch diameter shall be cast-iron fittings conforming to the requirements of ANSI/AWWA C110/A21.10.
- C. Fittings shall be provided with joints suitable for use with the pipe with which they are to be installed.

- D. Only those fittings and accessories that are of domestic (USA) manufacture will be acceptable.

2.03 RESTRAINED JOINTS

- A. Thrust Restraint. Thrust restraint for buried piping shall be provided by restrained joints for all buried piping.
- B. Restrained Joints. Restrained joints shall be of the essentially boltless type which relies on metal lugs, rotating retainer rings, or stainless-steel gaskets for joint restraint. All welded retainer rings shall be factory installed. Generally, joints shall be of the type which can be removed without damage to the joint if necessary to separate the joint after the initial installation. Stainless steel gasket type insert type shall be limited to locations not normally subjected to possible joint separation. A restrained joint shall be installed on each side of all buried valves. The length of restrained joints shall be as detailed on the Drawings. Ductile-iron retainer glands shall not be accepted.
- C. Restrained joints connecting ductile-iron pipe to ductile-iron fittings shall be Megalug Joint Restraint as manufactured by EBBA Iron, Inc.
- D. Concrete Thrust Blocks. Concrete thrust blocks may be required by the Engineer and shall be installed at tees, bends, dead ends and fire hydrants. Concrete thrust blocks should not be used if the soil is saturated or not suitable to resist the piping reactions or when above ground features prevent the installation of restrainers on existing pipe. Engineer shall approve each thrust block installation prior to placement.

2.04 GASKETS

- A. Gaskets for use with mechanical or push-on joints shall conform to the requirements of ANSI/AWWA C111/A21.11.
- B. Gaskets for use with flanged joints shall be of rubber, ring or full-face, 1/8 inch thick and shall conform to the dimensions shown in the Appendix to ANSI/AWWA C115/A21.15.

2.05 BOLTS AND NUTS

- A. Bolts and nuts for use with flanged joints shall be hex-head conforming to the requirements of ANSI B18.2.1 and B18.2.2.
- B. Bolts for use with mechanical joints shall be tee-head bolts with hexagonal nuts conforming to the requirements of ANSI/AWWA C111/A21.11.

2.06 COATINGS

- A. Coatings. Pipe and fittings which are to be buried or installed in concealed locations shall have a bituminous coating approximately 1 mil thick applied to the outside. The finished coating shall be continuous, smooth, neither brittle when cold nor sticky when exposed to the sun and shall be strongly adherent to the pipe.
- B. Pipe and fittings in interior or exposed locations which are to be painted shall be furnished with no exterior coating or with a primer coat which will be compatible with the finish coat to be applied.
- C. Marking. All buried reuse piping shall be marked with three identifying purple stripes permanently attached to the outside of the pipe. Each stripe shall be the length of the pipe and a minimum of two (2) inches wide. The stripes shall be located at 10 o'clock, 12 o'clock and 2 o'clock positions at the time of installation.
- D. Marking tape shall be an adhesive backed (pressure sensitive) non-detectable underground marking tape suitable for direct placement on the pipe.
- E. Tape shall be an approved APWA color code for pipeline identification. Marking tape to be Shieldbond Thor Enterprises, Inc., or approved equal.

2.07 LININGS

- A. Cement Mortar Lining. Pipe and fittings which are to be used for potable water service or effluent reuse service shall have a cement mortar lining conforming to the requirements of ANSI/AWWA C104/A21.4.
- B. Pipe and fittings which are to be used to handle sewage or aggressive chemical wastes shall be lined with one of the following:
 - 1. Coal Tar Epoxy Lining. Pipe and fittings shall be lined with a coal tar epoxy, composed of a two component coal tar epoxy compound capable of at least 50 mils dry film build in a one-coat multi-pass application process.

The material must also meet the following minimum performance requirements:

- a. A direct impact resistance as measured by ASTM D-2794 at 35 mils dry film thickness on ductile-iron panels. The material shall pass 100 inch pounds of impact.
- b. A dielectric strength of at least 300 volts per mil when fully cured.
- c. An abrasion resistance of 25 liters per mil as measured in ASTM D-968.

- d. Following immersion tests without failure of any kind. The lining must be on ductile-iron panels at 35 mils minimum dry film thickness.

<u>Test</u>	<u>Duration</u>
Tap water 160 degrees F.	1000 Hrs.
3% Sulfuric Acid 120 degrees F.	1500 Hrs.
25% Sodium Hydroxide 70 degrees F.	500 Hrs.
Continuous moisture condensation in Hydrogen Sulfide atmosphere	1000 Hrs.

- 1) The lining shall be applied under the supervision of the pipe manufacturer.
 - 2) All surface areas which will be exposed to liquids and gases shall be cleaned and deleterious materials removed. After cleaning, the lining compound shall be applied to all surface areas which will be exposed to liquids and gases. The lining compound shall be applied so as to obtain a continuous and relatively uniform and smooth lining. The barrel of the pipe shall be coated to achieve a 45 mils minimum dry film thickness when measured with a dry film thickness magnetic gage; lining will be tapered at pipe ends. After clearing, all joint surface areas and spigot ends exposed to the liquids and gases shall receive one coat of the lining material brushed on at a rate to achieve 10 mils minimum dry film thickness when measured with a magnetic dry film thickness gage.
 - 3) Any damaged lined areas shall be repaired in accordance with the manufacturer's recommendations so that the repaired area is equal to the undamaged lined areas.
- e. Polyethylene Lining. The lining shall be a blend of high-density and low-density polyethylene powders complying with ASTM D1248 compounded with carbon black to provide resistance to ultraviolet rays during storage above ground. The pipe shall be heated to an adequate temperature to provide uniform fusing of the polyethylene powders and proper bonding to the pipe. The polyethylene lining shall be 40 mils thick.

2.08 POLYETHYLENE ENCASEMENT

- A. Where polyethylene encasement is required it shall be either tube or sheet material conforming to the requirements of ANSI/AWWA C105/A21.5.

2.09 PIPE COUPLINGS

- A. Pipe couplings used to joint two pieces of plain end pipe shall be sized to suit the outside diameter of the pipe ends to be jointed. Transition couplings shall be used to join pipes of different outside diameters. Pipe couplings shall be bolted type with steel middle ring and end followers. The couplings shall be restrained for the test pressure of line using approved retaining system.
- B. All carbon steel parts of coupling shall be coated on the interior and exterior with a fusion bonded thermosetting epoxy coating with a 12 mil nominal coating thickness. The coating shall be equal to AL-CLAD as manufactured by Dresser Industries, Inc., or approved equal.
- C. Gaskets for the coupling shall be wedge type manufactured of Buna-N resilient rubber.
- D. Bolts shall be manufactured of high strength Type 304 stainless steel with Type 316 stainless steel hexagonal nuts. Bolts and nuts shall conform dimensionally to ANSI/AWWA C111, latest revision.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect for defects, damage, dirt and debris in pipe. Clean if necessary. Discard and remove defective materials. Reject materials found unsatisfactory.

3.02 TRENCH CONSTRUCTION

- A. Excavation. Excavate trenches as specified in Section 31 23 00.
- B. Alignment and Grade. Lay pipelines to lines and grades established by Drawings and Specifications, with fittings and valves at the required locations unless otherwise approved by the Engineer. Valve-operating stems shall be oriented to allow proper operation. Install Hydrants plumb.
- C. Underground Conflicts. Prior to excavation, investigate to the extent necessary to determine the location of existing underground structures and conflicts. Exercise care to avoid damage to existing structures. When obstructions that are not shown on the drawings are encountered during the progress of the work and interfere so that an alteration of the Drawings is required, the Engineer will alter the Drawings

or order a deviation in line and grade or arrange for removal, relocation, or reconstruction of the obstructions. When crossing existing pipelines or other structures, alignment and grade shall be adjusted as necessary, with the approval of the Engineer, to provide clearance as required by federal, state, or local regulations or as deemed necessary by the Engineer to prevent future damage or contamination of either structure.

- D. Trench Preparation. Trench preparation shall proceed in advance of pipe installation for only as far as necessary to allow proper pipe installation. The width of the trench at the top of the pipe shall be ample to permit the pipe to be laid and joined properly and allow the backfill to be placed as specified.
1. Holes for the bells shall be provided at each joint but shall not be larger than necessary for joint assembly and assurance that the pipe barrel will lie flat on the trench bottom. Other than noted previously, the trench bottom shall be true and even in order to provide support for the full length of the pipe barrel, except that slight depressions may be provided to allow withdrawal of pipe slings or other lifting tackle.
 2. When excavation of rock is encountered, all rock shall be removed to provide a clearance of at least 6-inches below and on each side of all pipe, valves, and fittings for pipe sizes 24-inches or smaller, and 9-inches for pipe 30-inches and larger. When excavation is completed, a bed of sand, crushed stone or earth that is free from stones, large clods, or frozen earth shall be placed on the bottom of the trench to the previously mentioned depths, leveled, and tamped. These clearances and bedding procedures shall also be observed for pieces of concrete or masonry and other debris or subterranean structures, such as masonry walls, piers, or foundations that may be encountered during excavation.
 3. This installation procedure shall be followed when gravel formations containing loose boulders greater than 8-inches in diameter are encountered. In all cases, the specified clearances shall be maintained between the bottom of all pipe and appurtenances and any part, projection, or point of rock, boulder, or stones of sufficient size and placement which, in the opinion of the Engineer could cause fulcrum point.
 4. Should the trench pass over a sewer or other previous excavation, the trench bottom shall be sufficiently compacted to provide support equal to that of the native soil or conform to other regulatory requirements in a manner that will prevent damage to the existing installation.
 5. When the subgrade is found to be unstable or to include ashes, cinders, refuse, organic material, or other unsuitable material, such material shall be removed, to a minimum of at least 3-inches, or to the depth ordered by the Engineer and replaced under the directions of the Engineer with clean,

stable backfill material. The bedding shall be consolidated and leveled in order that the pipe may be installed as specified.

6. When the bottom of the trench or the subgrade is found to consist of material that is unstable to such a degree that, in the judgment of the Engineer, it cannot be removed, a foundation for the pipe and/or appurtenance shall be constructed using piling, timber, concrete, or other materials at the direction of the Engineer.

3.03 PIPE INSTALLATION

- A. Provide and use proper implements, tools, and facilities for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be lowered carefully into the trench by means of a derrick, ropes, or other suitable tools or equipment in such a manner as to prevent damage to pipeline material and protective coatings and linings. Under no circumstances shall pipeline materials be dropped off or dumped into the trench. Dewater trench prior to installation of the pipe.
- B. Examine all pipe fittings, valves, and other appurtenances carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer who may prescribe corrective repairs or reject the materials.
- C. Remove all lumps, blisters, and excess coating from the socket and plain ends of each pipe. Wipe the outside of the plain end and the inside of the bell clean, dry and free from dirt, sand, grit, or any foreign material before the pipe is laid.
- D. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.
- E. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
- F. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. When practical, the plug shall remain in place until the trench is pumped completely dry. Care shall be taken to prevent pipe flotation should the trench fill with water.
- G. Trench width at the top of pipe, bedding conditions, and backfill placement and compaction shall be such that design loadings on the pipe will not be exceeded.
 1. Joint Assembly. Pipe joints shall be assembled in accordance with the Manufacturer's instructions and the requirements of ANSI/AWWA C600.

2. Pipe Deflection. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, or where long radius curves are permitted, the amount of deflection shall not exceed that shown in ANSI/AWWA C600.
3. Pipe Cutting. Cutting pipe for the insertion of valves, fittings, or closure pieces shall be done in a neat, workmanlike manner without creating damage to the pipe or lining. Ductile cast iron may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, milling wheel saw, or oxyacetylene torch. Cut ends and rough edges shall be ground smooth and for push-on joint connections, the cut end shall be beveled.
4. Thrust Restraint. Thrust restraint of buried piping shall be provided by restrained joints.
5. Restrained Joints. All plugs, caps, tees and bends shall be suitably restrained by restrained joints as specified.
6. Concrete Thrust Blocks. All plugs, caps, tees, bends, and fire hydrants shall be provided with concrete thrust blocks.
7. Vertical and horizontal reaction backing shall be made of concrete having a compressive strength of not less than 3,000 psi after 28 days.
8. Backing shall be placed between solid ground and the fitting to be anchored; the area of bearing on the pipe and this ground in each instance shall be that shown or directed. The backing shall, unless otherwise shown or directed, be so located as to contain the resultant thrust force and so that the pipe and fitting joints will be accessible for repair. Concrete thrust blocks shall not cover or encase bolts.
9. Thrust Restraint Design Pressure. Thrust restraint design pressure shall be equal to 1.5 times the design pressure of the line or 150 psi, whichever is greater.

3.04 POLYETHYLENE ENCASEMENT

- A. Where shown on the Drawings or where directed when corrosive soil conditions are encountered install polyethylene encasement in accordance with requirements of ANSI/AWWA C105/A215.

3.05 TESTING

- A. Test completed piping system in accordance with the requirements of Section 33 01 12: Inspection and Testing of Water Utilities.

3.06 DISINFECTION

- A. Disinfect pipelines to be used for potable water in accordance with requirements of Section 33 01 12.

END OF SECTION

SECTION 33 05 93
ELECTRIC MOTORS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Scope of Work: This Section covers the quality criteria, design standards, materials, and installation procedures for electric motors.

The requirements of this Section shall apply to all electric motors except as specifically noted in the specific equipment specifications.

- B. Related Work Described Elsewhere:

1. Shop Drawings: Section 01 33 23.
2. Materials and Equipment: Section 01 60 00.
3. Start-up: Section 01 75 16.
4. Operation & Maintenance Data: Section 01 78 23.
5. Warranties: Section 01 78 36.
6. Specific electric motor data not covered in this section is specified with the equipment to be driven.

1.02 QUALITY ASSURANCE

- A. Electric motors shall conform to the latest standards of IEEE, ANSI, and NEMA.
- B. Motors shall be warranted against defects in materials and workmanship and failure resulting from normal usage for a period of one (1) year after final acceptance of the project. (See Section 01 78 36: Warranties)
- C. Shop Tests and Test Reports: All motors of frame size 180 or larger shall be given a standard short commercial test conforming to IEEE, ANSI and NEMA Standard requirements to determine that they are free from electrical or mechanical defects and to provide assurance that they meet design conditions. These tests shall include:
1. Running light current.
 2. Locked rotor current.
 3. Secondary voltage at collector rings (wound rotor motors).

- 4. High potential.
 - 5. Winding resistance.
 - 6. Vibration and balance test in accordance with NEMA standard MG 1-12.05 and MG 1-12.06 and Hydraulic Institute Standards.
- D. All standard efficiency motors shall, at a minimum, have a nominal (or average) full load motor efficiency determined in accordance with NEMA Standard MG 1-12.53a and IEEE-112, Test Method B, as indicated in Tables 33 05 93-A and 33 05 93-B.
 - E. All high (or premium) efficiency motors shall, at a minimum, have a guaranteed minimum full load motor efficiency determined in accordance with NEMA Standard MG 1-12.53a and IEEE-112, Test Method B, as indicated in Tables 33 05 93-A and 33 05 93-B.
 - F. All motors shall have efficiency ratings calculated, labelled, and stated in accordance with NEMA Standard MG 1-12.53b.
 - G. Motors shall be manufactured by Reliance Electric, U.S. Motors, General Electric, or equal.

1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 23.
- B. Certified copies of the standard short commercial test shall be submitted for each motor having a frame size of 180 or larger.
- C. Certified copies of test reports verifying compliance with specified nominal (average) full load efficiency shall be submitted for electrically duplicate units of each standard efficiency motor type to be supplied.
- D. Certified copies of test reports verifying compliance with specified minimum guaranteed full load efficiency shall be submitted for electrically duplicate units of each high (or premium) efficiency motor over 100 horsepower (hp) or less.
- E. Certified copies of test reports verifying compliance with specified minimum guaranteed full load efficiency shall be submitted for each individual high (or premium) efficiency motor over 100 hp to be supplied.
- F. Completed Motor Data Sheet (Table 33 05 93-C attached).

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. The CONTRACTOR shall be responsible for adequately and properly storing and maintaining the motors from the time received at the job site to actual start-up operations and client acceptance of motors (See Section 01 60 00).

- B. Lifting lugs shall be furnished on motors over 25 pounds and shall be designed in accordance with NEMA MG 2-2.02.
- C. Motors with heaters which are in storage on the job site in excess of 45 days before connection to permanent power shall have temporary power connected to the heaters.

1.05 DESIGN CONDITIONS

- A. Motor Design: The use of NEMA Designs B or C for motors over one-half (1/2) hp shall be as follows:
 - 1. Design B motors shall be used on equipment at full (or reduced) voltage start requiring normal starting torque and current.
 - 2. Design C motors shall be used on equipment at full (or reduced) voltage start requiring a high starting torque and normal starting current.
 - 3. All motors 100 hp or greater shall be capable of autotransformer reduced voltage starting.
 - 4. Locked rotor, starting and breakdown torques shall be as called for in the NEMA standards for the Design involved.
- B. Enclosure Type: Unless indicated in the equipment specification, motor enclosures shall be as follows:
 - 1. In interior, clean, dry, and ventilated locations, use open drip-proof frames (ODP) or Weather Protected Type I (WPI).
 - 2. Interior use with hose washdown of floors and possible wetting shall use TEFC.
 - 3. Interior or exterior use with a dusty environment shall use totally enclosed fan cooled (TEFC) motors.
 - 4. Exterior installations shall use TEFC motors.
 - 5. Exterior use in hostile environment shall use a TEFC motor up to 300 hp and Weather Protected Type II motors for 300 hp and up in size.
 - 6. Installations in a potentially explosive environment shall use applicable Class I explosion proof motors.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- A. Motor Design: The driven equipment manufacturer shall be responsible for sizing the motors in coordination with the driven equipment such that the name plate rated horsepower is not exceeded and motors are not required to operate in the safety factor at any point within the driven equipment's operating range. Motor design for motors over one-half (1/2) hp shall be NEMA Design B, except when NEMA Design C is required by the equipment manufacturer. Unless noted otherwise, all motors (except explosion proof motors) shall be provided with a minimum 1.15 service factor. Motors shall be standard efficiency or high premium efficiency as indicated in the equipment specification and shall have a minimum full load efficiency in accordance with Section 1.02 and Table 33 05 93-A and Table 33 05 93-B.
- B. Motor enclosure shall be ODP, totally enclosed fan cooled, Class I explosion-proof, or Weather Protected Type I or II as listed for each motor or specified in 1.05 B. above.
- C. Insulation: Unless otherwise noted in the equipment specification, the insulation system shall be as follows:
 - 1. Motor winding and rotor insulation shall be in accordance with NEMA MG 1-12.42, Class F, with a Class B temperature rise at rated service factor using resistance, except that single phase fractional horsepower motors may have Class B insulation.
 - 2. Stator winding, end coils and rotor windings (wound rotor motors) for open (ODP) and weather protected (WPI and WPII) motors having a frame size of 320 or larger shall receive two (2) coats of 100 percent (100%) solid solventless epoxy.
 - 3. Stator winding, end coils and rotor windings (wound rotor motors) for totally enclosed motors shall receive one (1) coat of 100 percent (100%) solid solventless epoxy.
 - 4. Epoxy shall be applied using vacuum and pressure impregnation (VPI) in accordance with NEMA Standard MG 1-1.27A for all motors having a frame size of 320 or larger.
 - 5. Stator, rotor, exciter, and line leads on all motors having a frame size of 180 or larger shall be coated with fungicidal varnish or paint.

2.02 MATERIALS AND CONSTRUCTION

- A. General: Unless otherwise noted, materials and construction of motors shall be as described in the following paragraphs.
- B. Materials and construction of all motors shall be as follows:

1. Enclosures for open and weather protected motors having a frame size of 320 or larger shall be constructed of cast iron including outlet box and brackets. Enclosures for TEFC motors having a frame size of 180 or larger shall similarly be constructed of cast iron. Smaller motors may be constructed of fabricated steel or aluminum. The frame, and brackets, terminal box and fan cover shall be of similar material.
 2. Bearings shall be antifriction type, grease lubricated with a 40,000-hour average life in accordance with B-10, AFBMA Life Values, except that bearings in a belt drive configuration may have an average B-10 life of 25,000 hours.
 3. Motors with vertical hollow shaft shall have non-reversing ratchets for 30 percent (30%) momentary upthrust of the rated power thrust.
 4. Motors shall have a decibel sound level to meet NEMA Standard MG 1 12.49 sound power levels and applicable provisions of OSHA. Sound measurements shall be in accordance with IEEE 85 procedures.
 5. Motors shall have a nameplate including information as required by NEMA MG 1-10.37 and 10.38 plus the following:
 - a. Generic Bearing Identification Numbers.
 - b. Full Load Efficiency [plus full load power factor and maximum KVAR value for high (or premium) efficiency motors].
 6. Hardware and screens shall be corrosion resistant.
- C. In addition to the requirements listed above, all TEFC motors shall also be equipped as follows:
1. Fans shall be constructed to resist corrosion and be of non-sparking material.
 2. Neoprene shaft slinger shall be provided and lead wires shall be non-braided and non-wicking to prevent entrance of moisture and contaminants.
 3. Grease fittings shall be non-corroding.
 4. All leads shall be brought out to a separate terminal box and shall be marked and identified. The terminal box shall be split construction, double gasketed, containing provisions for grounding the motor, and shall comply with NEMA standards for minimum volume.
 5. Motors shall have brass or stainless steel breather drains at both ends to allow proper drainage of condensation.

- 6. Nameplates, as specified in Paragraph B above, shall be made of stainless steel and fastened with stainless steel pins.
- 7. Motors having a frame size of 320 or larger shall be provided with a 120 volt, single phase strip type heaters to maintain a motor temperature of at least 40°C or 10°C above ambient, whichever is greater.
- D. Voltage: Unless noted otherwise, all motors one-half (1/2) hp and less shall be 115/230 volt, 60 hertz, single phase; and motors larger than one-half (1/2) hp shall be 23-/460 volt, 60 hertz, three (3)-phase.

PART 3 – EXECUTION

3.01 MOTORS

- A. All motors shall be provided and factory mounted by the driven equipment manufacturer in accordance with the motor manufacturer's drawings and instructions. Field installation of the unit, including final alignment shall be the responsibility of the CONTRACTOR.

3.02 PAINTING

- A. Motors shall be prime coated prior to shipment. Primer shall be of same type and manufacture as used by the General CONTRACTOR as specified in Section 09 91 00 Painting. After installation and before being placed in final operation, the CONTRACTOR shall have motors painted in accordance with the requirements of Section 09 91 00.

3.03 FIELD QUALITY CONTROL

- A. Field Tests: The motors shall be run in for four (4) before being reconnected to the equipment.

3.04 SPARE PARTS

- A. The CONTRACTOR shall furnish one (1) set of bearings, tagged, and marked for identification and recording on motors over 100 hp in size.

TABLE 33 05 93-A MINIMUM FULL LOAD EFFICIENCIES FOR VERTICAL MOTORS					
HP	Nominal RPM	OPEN MOTORS		TOTALLY ENCLOSED MOTORS	
		Normal (Standard) Efficiency	High (Premium) Efficiency	Normal (Standard) Efficiency	High (Premium) Efficiency
1	1,800				83.5
	900				83.0
1.5	3,600			73.5	
	1,800			79.0	83.0
	1,200			75.0	84.5
	900			76.0	83.0
2	3,600			77.0	
	1,800			81.0	83.0
	1,200	77.0	85.5	77.5	84.5
	900	72.0	80.0	72.0	82.5
3	3,600	80.0	84.0	75.0	
	1,800	80.0	85.5	78.5	86.5
	1,200	78.5	85.5	78.5	85.5
	900	74.0	82.0	74.0	82.5
5	3,600	81.0	86.5	79.5	
	1,800	81.5	86.0	81.0	86.5
	1,200	83.0	85.5	80.0	86.0
	900	78.5	88.0	78.5	85.5
7.5	3,600	84.0	86.5	81.5	87.5
	1,800	83.5	90.5	83.5	88.0
	1,200	83.0	89.0	85.5	88.5
	900	80.0	88.0	80.0	86.0
10	3,600	83.5	90.5	82.0	89.5
	1,800	86.5	90.5	85.5	89.0
	1,200	82.5	89.5	85.0	88.5
	900	84.0	89.0	84.0	87.0
15	3,600	85.0	89.5	81.0	89.5
	1,800	85.5	92.0	85.5	89.0
	1,200	86.5	92.0	84.5	90.0
	900	85.5	92.0	84.5	89.5
20	3,600	85.5	92.0	84.5	90.0

TABLE 33 05 93-A MINIMUM FULL LOAD EFFICIENCIES FOR VERTICAL MOTORS					
<i>HP</i>	<i>Nominal RPM</i>	<i>OPEN MOTORS</i>		<i>TOTALLY ENCLOSED MOTORS</i>	
		<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>
	1,800	88.0	92.5	87.0	90.5
	1,200	88.0	90.0	85.5	88.5
	900	85.0	89.5	87.0	89.5
25	3,600	88.5	92.5	87.0	91.0
	1,800	88.5	92.5	88.5	90.5
	1,200	85.5	90.5	88.0	90.0
	900	86.0	90.5	88.0	89.5
30	3,600	88.5	90.5	88.5	90.0
	1,800	89.0	93.0	88.5	91.0
	1,200	86.5	91.5	88.0	90.5
	900	88.0	90.0	89.0	91.0
40	3,600	88.5	90.5	88.5	90.0
	1,800	88.0	93.0	89.5	92.0
	1,200	87.5	91.0	89.5	91.5
	900	88.0	90.0	89.0	91.0
50	3,600	88.0	91.0	89.5	90.0
	1,800	89.0	93.5	90.5	92.0
	1,200	88.0	91.0	90.5	90.0
	900	88.5	90.5	89.5	91.5
60	3,600	89.5	92.0	89.5	91.5
	1,800	90.0	93.5	91.0	93.5
	1,200	88.5	92.0	91.5	92.0
	900	89.0	91.5	91.0	92.5
75	3,600	89.5	92.5	91.0	92.0
	1,800	91.5	94.0	91.5	93.5
	1,200	89.5	93.5	91.5	92.0
	900	89.0	93.5	90.0	92.0
100	3,600	91.0	92.5	90.0	91.5
	1,800	91.0	94.5	91.5	93.0
	1,200	91.5	93.5	92.0	93.5
	900	89.0	93.5	91.5	92.0

TABLE 33 05 93-A (Continued)					
MINIMUM FULL LOAD EFFICIENCIES FOR VERTICAL MOTORS					
<i>HP</i>	<i>Nominal RPM</i>	<i>OPEN MOTORS</i>		<i>TOTALLY ENCLOSED MOTORS</i>	
		<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>
125	3,600	91.0	92.5	91.0	91.5
	1,800	92.0	94.0	92.0	93.5
	1,200	91.5	93.5	93.0	93.5
	900	89.5	93.5	92.0	93.0
150	3,600	91.5	93.0	91.5	91.5
	1,800	92.0	95.0	92.5	94.5
	1,200	92.0	94.0	93.0	94.5
	900	91.5	93.5	92.0	93.0
200	3,600	92.0	92.5	91.5	92.0
	1,800	92.5	94.5	94.5	94.5
	1,200	91.5	94.0	93.5	94.0
	900	91.5			
250	3,600	92.0	92.5	92.0	93.0
	1,800	93.0	94.5	93.5	95.0
	1,200	91.0	95.0	94.0	94.0
	900	92.0			
300	1,800	91.5	95.0		94.5
	1,200	92.0			
	900	92.0			
350	1,800	92.0			
	1,200	91.5			
	900	92.5			
400	1,800	92.0			
	1,200	91.5			
	900	92.0			
450	1,800	92.5			
	1,200	91.5			
	900	92.0			
500	1,800	93.0			
	1,200	92.0			
	900	91.5			

TABLE 33 05 93-B MINIMUM FULL LOAD EFFICIENCIES FOR HORIZONTAL MOTORS					
<i>HP</i>	<i>Nominal RPM</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>
0.75	1,200	92.0	77.0	72.0	77.0
	900	68.0	75.5	67.5	
1	3,600			71.0	
	1,800	72.0	81.5	72.0	81.5
	1,200	73.0	78.5	76.5	78.5
	900	68.0	77.0	67.5	
1.5	3,600	78.0	81.5	75.5	81.5
	1,800	74.0	81.5	77.0	81.5
	1,200	75.5	82.5	78.5	84.0
	900	72.0	79.0	69.5	
2	3,600	70.0	84.0	80.0	84.0
	1,800	77.0	81.5	80.0	81.5
	1,200	76.0	85.5	78.5	85.5
	900	72.0	82.5	72.0	83.5
3	3,600	80.0	84.0	75.5	84.0
	1,800	80.0	86.5	78.5	85.5
	1,200	78.5	85.5	78.5	88.0
	900	74.0	84.0	74.0	84.5
5	3,600	82.5	84.0	81.5	86.5
	1,800	84.0	88.5	84.	89.5
	1,200	81.0	87.0	81.5	88.0
	900	78.5	86.0	78.5	88.0
7.5	3,600	85.5	86.5	80.0	88.0
	1,800	84.0	88.5	84.0	89.5
	1,200	81.5	88.5	81.5	88.5
	900	78.5	87.0	78.5	88.0
10	3,600	86.5	87.5	84.0	89.5
	1,800	84.5	89.5	85.5	89.5
	1,200	82.5	89.5	82.5	89.5
	900	81.5	89.0	81.5	89.5
15	3,600	86.5	88.5	84.0	89.5
	1,800	86.5	90.5	85.5	91.0
	1,200	83.0	90.0	84.0	90.0
	900	84.0	89.0	84.0	89.5
20	3,600	85.5	89.5	84.0	90.5
	1,800	85.5	90.5	86.5	91.5
	1,200	85.0	90.5	86.5	90.5
	900	85.0	90.0	86.5	90.5

TABLE 33 05 93-B (Continued)					
MINIMUM FULL LOAD EFFICIENCIES FOR HORIZONTAL MOTORS					
<i>HP</i>	<i>Nominal RPM</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>
25	3,600	87.0	90.0	84.0	90.5
	1,800	87.5	91.0	87.5	92.0
	1,200	86.5	91.0	86.5	91.0
	900	86.5	90.0	86.5	90.5
30	3,600	86.5	90.0	84.0	91.0
	1,800	88.5	91.5	88.5	92.0
	1,200	87.0	91.5	87.5	91.0
	900	86.5	91.5	86.5	92.5
40	3,600	88.5	90.0	96.5	91.5
	1,800	89.5	92.0	88.5	93.0
	1,200	88.0	92.0	88.5	92.0
	900	88.5	91.0	78.0	92.0
50	3,600	88.5	92.0	88.5	92.0
	1,800	90.0	93.5	90.0	93.0
	1,200	88.5	92.0	89.5	92.0
	900	88.5	91.5	88.5	92.5
60	3,600	89.5	92.0	88.5	92.5
	1,800	90.0	93.5	90.0	94.0
	1,200	90.0	93.0	90.0	93.0
	900	89.5	92.0	90.0	92.5
75	3,600	90.0	93.0	88.5	92.0
	1,800	90.0	94.0	90.0	94.5
	1,200	90.0	93.5	90.0	93.0
	900	90.0	93.5	90.0	93.0
100	3,600	90.0	93.5	89.5	93.0
	1,800	90.0	94.0	90.0	94.5
	1,200	90.0	93.5	90.0	93.5
	900	90.0	94.0	90.0	93.0
125	3,600	90.0	93.5	90.0	93.5
	1,800	91.0	94.0	90.0	94.5
	1,200	91.0	93.5	91.0	94.0
	900	90.0	94.0	91.5	93.5
150	3,600	91.0	93.5	91.5	93.5
	1,800	91.5	95.0	93.0	95.0
	1,200	91.5	94.5	93.0	94.5
	900	91.0	94.0	92.0	93.5

TABLE 33 05 93-B (Continued)					
MINIMUM FULL LOAD EFFICIENCIES FOR HORIZONTAL MOTORS					
<i>HP</i>	<i>Nominal RPM</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>	<i>Normal (Standard) Efficiency</i>	<i>High (Premium) Efficiency</i>
200	3,600	91.5	94.0	93.0	94.5
	1,800	91.5	95.0	93.0	95.0
	1,200	92.0	94.5	93.0	94.5
	900	92.0	93.0	94.0	
250	3,600	92.0	94.0	93.0	94.5
	1,800	93.0	95.0	93.5	94.5
	1,200	91.5	94.5	94.0	94.5
	900	93.0			
300	3,600	93.0	95.0	94.0	95.0
	1,800	93.0	95.5	94.0	95.0
	1,200	93.0	94.5		
350	3,600	93.5	95.0	95.0	95.0
	1,800	94.5	95.5	94.5	95.0
	1,200	94.0			
	900				
400	3,600	94.0	95.5	95.0	
	1,800	94.0	95.5		
	1,200				
	900				
450	3,600	94.5			
	1,800	93.5			
	1,200				
	900				

Table 33 05 93-C
MOTOR DATA SHEET

Quantity: Efficiency (Standard or High):

Horsepower: Efficiency* Value:

*Nominal (average) efficiency for standard efficiency motors or
 guaranteed minimum efficiency for high (premium) motors.

Frame Number:

Enclosure Material:

Enclosure:

Volts/Phase/Hertz:

Service Factor:

Insulation Class;

Temp Rise Class (@rated service
 factor using resistance):

NEMA Design Letter:

Respond to the Following with Yes, No or Not Applicable (N/A)

1. Motor is designed, labelled, and tested in accordance with the latest standards of NEMA, IEEE and ANSI?
2. Motor efficiency has been determined in accordance with NEMA standard MG 1-12.53a and IEEE-112, Test Method B?
3. Lifting Lugs are provided?
4. Motor is capable of autotransformer reduced voltage starting
5. Motor is designed for the following conditions:
 - Altitude below 3,300 feet
 - Ambient temperature of 40°C
 - Voltage variation (each phase) plus or minus 10 percent ($\pm 10\%$) of nameplate values

- Frequency variation (each phase) plus or minus 5 percent ($\pm 5\%$) of nameplate values
 - The arithmetic sum of the absolute value of the voltage and frequency variations equal to or less than 10 percent ($\leq 10\%$)
6. Motors do not exceed the nameplate horsepower at any point within the driven equipment's operating range
 7. Stator winding, end coils and rotor windings (wound rotor motors) will receive the specified number of coats of 100 percent (100%) solid solventless epoxy
 8. Epoxy shall be applied using vacuum and pressure Impregnation (VPI)
 9. Stator, rotor, exciter, and line loads shall be coated with fungicidal varnish or paint
 10. Motor complies with all criteria specified in paragraph 2.02, B except as follows:

Exceptions:

11. Motor complies with all criteria specified in paragraph 2.02, C except as follows:

Exceptions:

12. Motor shall be shop (primed or finished) (circle one) in accordance with specification Section 09 91 00
13. Motor meets or exceeds the applicable efficiency value listed in Table 33 05 93-A or 33 05 93-B

END OF SECTION

SECTION 33 30 00
SANITARY SEWER SYSTEMS

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. The work included under this section consists of furnishing all labor, equipment, and materials necessary for the construction of sanitary sewer, sewer connections, and appurtenances as shown on the drawings or specified herein.
- B. Related Work Specified Elsewhere:
 - 1. Section 31 23 00: Excavation, Backfill and Embankment.
 - 2. Section 03 30 00: Cast-In-Place and Poured Concrete.
 - 3. Section 03 40 00: Precast Concrete Structures.

1.02 SUBMITTALS

- A. Shop drawing manufacturer's literature and other descriptive material of all equipment and materials shall be submitted in accordance with Section 01 33 23: Shop Drawings.
 - 1. Precast manholes.
 - 2. Manholes frames, covers, and other castings.
 - 3. Catalog Data: Submit for pipe and fittings.
 - 4. Manhole – Pipe Connections.

1.03 DAMAGE CONTROL – PVC PIPE

- A. Transportation. Care shall be taken during transportation of the pipe that it is not cut, kinked or otherwise damaged.
- B. Handling Pipe Lengths.
 - 1. Ropes, fabric, or rubber protected slings and straps shall be used when handling pipe.

2. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two (2) slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground.
- C. Storage. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe.
1. Stacking of the polyvinyl chloride pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions.
 2. Where necessary due to ground conditions the pipe shall be stored on wooden sleepers, spaces suitable and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Polyvinyl chloride pipes. Plastic gravity sewer pipe and fittings shall be unplasticized polyvinyl chloride (PVC) and conform to the requirements of ASTM Designation D 3034 or ASTM F 679, Type PSM, Class 12454-B or 12454-C, SDR-35 with elastomeric gasket joints. PVC pipe and fittings shall be as manufactured by Johns-Mansville, Certainteed, H&W Industries, or equal.
- B. Plastic (PVC) sewer fittings shall conform to the requirements of ASTM D 3034 standard with minimum wall thickness of SDR 35. Fittings eight-inch (8") and smaller shall be molded in one (1) piece with gasket joints that are of a molded "locked in" design to prevent loss during transport or "fish mouthing" during pipe insertion. The minimum socket depths shall comply with ASTM D 3034. Fittings 10 inch (10") and larger shall be molded or fabricated in accordance with manufacturers standard pipe bells and gaskets. Gaskets shall have minimum cross sectional area of 0.20 square inch and conform to ASTM F 0477 standard. PVC material shall have a cell classification of 12364-B or C as defined in ASTM D 1784. All fittings shall be supplied by one manufacturer and shall comply with the following additional ASTM standards: ASTM F 1336, ASTM D 3212, and ASTM F 913. All PVC fittings must be certified by CSA to the CSA B182.1 and CSA B182.2 standards as third party certification.
- C. Where indicated on the drawings large diameter PVC may be used conforming to the requirements of AWWA C-905.

- D. Ductile iron pipe.
1. Ductile iron sewer pipe shall conform to the requirements of ANSI Standard A21.51, Class 50. Pipe shall be epoxy lined as specified herein. Bituminous coating shall be applied to the outside of pipe as specified in ANSI Standard A21.51. Joints shall be mechanical or push-on and conform to ANSI A21.11. Gaskets shall be of neoprene and shall have plain tips unless otherwise specified.
 2. Pipe lining shall be epoxy.
- E. Concrete and reinforcing steel. Concrete and reinforcing steel shall conform to the requirements of Division 3 of these specifications. Concrete classes for the various purposes shall be as follows:
1. Manhole bottoms: Class "A".
 2. Pipe and riser encasement: Class "B".
 3. Protective slabs: Class "B".
- F. Castings. Gray iron castings for manhole frames, covers and other items shall conform to the ASTM Designation A 48, Class 30, and shall be U.S. Foundry and Manufacturing Corp., or equal. Castings shall be true and pattern in form and dimensions and free of pouring faults and other defects in positions which would impair their strength, or otherwise make them unfit for the service intended. The seating between frames and covers shall be machined to fit true. No plugging or filling will be allowed. Lifting or "pick" holes shall be provided, but shall not penetrate the cover. Casting patterns shall conform to those shown on the drawings. All manhole frames and covers shall be traffic bearing unless otherwise specified. Frames shall be suitable for the future addition of cast iron rings for upward adjustment of top elevation. Frame and cover shall have machined edges along with rubber gaskets for water-resistant closure.
- G. Manholes. Refer to Section 33 05 60: Manholes.
- H. Terminal manholes. Manhole frames and covers shall provide a clear opening equal to the connecting pipe and shall be round, solid lid, Neeah No. R-1974-A, or equal. Covers shall be marked "SANITARY".
- I. Brick. Brick for manhole construction shall be dense, hard burned, shale or clay brick conforming to ASTM Designation C 32, Grade MS.
- J. Cement mortar. Cement mortar for manhole construction shall be as specified in ASTM Designation C 270, Type M, except the cement shall be Portland Type II. No mortars that have stood for more than one (1) hour shall be used.

- K. Miscellaneous materials. Additional items of construction such as cleanouts, special manholes and other items necessary for the complete installation of the system shall conform to specific details on the drawings and shall be constructed of first-class materials conforming to the applicable portions of these specifications.
- L. Pipe connections. All opening for pipes in manholes shall be sealed watertight by Kor-N-Seal, Link Seal or equal.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Upon satisfactory excavation of the pipe trench, as specified in Section 31 23 00: Excavating, Backfilling and Compacting, a continuous trough for the pipe barrel and recesses for the pipe bells shall be excavated by hand digging so that, when the pipe is laid in the trench, true to line and grade, the pipe and barrel will receive continuous uniform support and the bell will receive no pressure from the trench bottom.
- B. The interior of all pipe shall be thoroughly cleaned of all foreign material before being lowered in the trench and shall be kept clean during laying operations by means of plugs, other approved methods.

3.02 INSTALLATION

- A. Sewer pipe.
 - 1. General.
 - a. Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow. Before pipe is joined, gaskets shall be cleaned of all dirt and stones and other foreign material. The spigot ends of the pipe and/or pipe gaskets shall be lubricated lightly with a lubricant as specified by the pipe manufacturer and approved by the ENGINEER. Sufficient pressure shall be applied to the pipe so as to properly seat the socket into the bell of the pipe. All pipes shall be laid straight, true to the lines and grades shown on the drawings in each manhole section.
 - b. Any pipe which is disturbed or found to be defective after laying shall be taken up and relaid or replaced.
 - c. Approved utility crossing signs shall be placed on the pipe alignment at each side of a waterway crossing.

2. PVC Pipe.

- a. Handling pipeline. The handling of the joined pipe line shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Section of the pipes with deep cuts and gouges shall be removed.
- b. Lowering pipe into trench. Care shall be exercised when lowering pipe into the trench to prevent damage to or twisting of the pipe.
- c. Special precautions. PVC pipe connected to heavy fittings, manholes and rigid structures shall be supported in such a manner that no subsequent relative movement between the pipe and the joint with the rigid structures is possible.

B. Service Connections.

1. Service connections, of the type called for on the drawings, shall be provided in accordance with the details as shown or indicated on the drawings.
2. Where called for on the drawings, sewer pipe of the size and type noted shall be extended above grade and plugged with an approved removable plastic plug. All connections and changes of direction shall be made using standard fittings designed for the purpose.
3. Where no curb exists, or is planned, locations shall be adequately marked by a method approved by the OWNER.

C. Concrete encasement. Class B concrete encasement shall be constructed in accordance with the details shown on the drawings. Encasement shall be constructed where:

1. The sewer or service crosses over, or at a depth which provides less than 18 inches (18") clear distance between pipes when crossing under potable water mains. Encasement shall extend a minimum of 10 feet (10') of each side of the point of crossing. In lieu of encasement, the sewer line may be constructed of ductile iron pipe and shall be laid such that both joints will be at least 10 feet (10') from the crossing.
2. The OWNER shall order the line encased:
 - a. If, through failure to provide suitable trench sheeting, or other causes, the maximum width for trench excavations, as specified elsewhere in these specifications, is exceeded, the CONTRACTOR shall construct concrete encasement around the pipe for the length of the excessive excavation. No payment will be made for the concrete encasement required due to excessive trench widths.

- b. The points of beginning and ending of sewer, or service pipe encasement shall be not more than six inches (6") from a pipe joint to protect the pipe from cracking due to uneven settlement of its foundation or the effects of superimposed live loads.
- D. Concrete protective slabs. Concrete protective slabs as shown on the drawings shall be constructed over gravity sewers that have less than three feet (3') of cover from finish grade.
- E. Manholes.
 - 1. General. Where shown on the drawings, the CONTRACTOR shall place stub-outs for future extensions. Both the manhole and exterior ends of all such stub-outs shall be closed with watertight plugs removable without damage to the pipe. One (1) section of pipe as shown on the plans shall be laid at each manhole stub-out.
 - a. Outside drop connections shall be made in accordance with the details therefore shown on the drawings.
 - b. The invert channels shall be smooth and accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer section. Steep slopes outside the invert channels shall be avoided. Changes in size and grade shall be made gradually and evenly. Changes in the direction of the sewer or entering branch shall be a smooth curve with radius as long as practicable. Invert channels shall also be formed for pipe stub-outs.
 - c. Prior to backfilling, each manhole/wetwell section joint shall be wrapped with "EZ-Wrap" butyl adhesive tape as manufactured by Press-Seal Gasket Corp, Concrete Supply Products Co., Fort Wayne, IN. Installation shall be in accordance with the manufacturers' written instructions and shall include the use of "EZ-Stik" #4 primer prior to application of adhesive tape. This requirement is in addition to the use of "Ram-Neck" sealant at each joint.
 - d. The interior and exterior surfaces of all manholes shall be coated prior to installation in accordance with Section 33 05 60. Upon installation, inside coating will be touched up.
 - e. Frames and covers shall be set accurately to grade to conform to the finished grade of the adjacent areas or final road wearing surface grade. All covers shall be watertight.
 - f. Manholes shall be completed as the work progresses so that testing as prescribed in paragraph 3.03 may be completed.
 - 2. Manholes, precast concrete:

- a. Precast manholes shall conform to the requirements of Section 33 05 60: Manholes.
- b. Precast manholes tops, shall terminate at such elevations as will permit laying up brick courses under the manhole frames to make allowance for future street grade adjustments. (See plan details.)
- c. Drop connections, where required on precast manholes, shall be manufactured with the manhole elements at the casting yard. The manufacturer shall submit for approval the method of drop manhole construction.
- d. The first pipe joint outside the manhole shall be located a maximum distance of three feet (3') from the outside surface of the manhole base slab.
- e. Where additional pipe connections or modifications of existing factory made openings are required on new or existing precast concrete manholes, penetrations shall be by coring and installation of Kor-N-Seal or Link Seal. If this method is not deemed feasible by the OWNER's representative, all cutting relative to the manhole shall be performed only by a power driven abrasive wheel or saw. It is specifically noted that such alternate connections to existing manholes shall be installed in accordance with the details for new units shown on the drawings, and shall be caulked water tight with non-shrinking grout.

- F. Connections to existing structures and sewers. Proposed sewer lines shall be connected to existing manholes and pipe stubs.

3.03 FIELD QUALITY CONTROL

- A. Workmanship. It is imperative that all sewers and appurtenances be built practically watertight and that the CONTRACTOR adheres rigidly to the specifications for materials and workmanship. Upon completion, the sewers, or sections thereof, will be tested and gauged and if leakage is above the allowable limits specified, the sewer will be rejected.
- B. Inspection. On completion of each block or section of sewer, or such other times as the OWNER may direct the block or section of sewer shall be cleaned, tested, and inspected.
 - 1. Each section of the sewer shall show, on examination from either end, a full circle of light between manholes.
 - 2. Each manhole or other appurtenances to the system shall be of the specified size and form, be watertight (no leakage allowed by visual inspection), neatly and substantially constructed, with the top set permanently to exact position and grade. All repairs shown necessary by the inspection shall be made; broken or cracked pipe replaced; all deposits

removed and the sewer left true to line and grade, entirely clean, and ready for use.

3. After the final backfill has been in place at least 30 days, polyvinyl chloride (PVC) pipe shall be tested for defection and deformation by pulling a mandrel through the entire length of the pipe. The mandrel shall have a diameter equal to 95 percent (95%) of the inside diameter of the pipe. Any pipe found to be deformed and/or deflected in excess of five percent (5%) of the nominal diameter of the pipe shall be removed and replaced with new pipe at no additional cost to the OWNER. Results of the tests shall be submitted to the OWNER and ENGINEER, in a report format approved by the Design ENGINEER. The cost of this service shall be included in the unit price bid for the particular item to which it is related.
4. Prior to final acceptance, the CONTRACTOR shall provide an acceptable video tape and log of all gravity sewer lines placed. Any bad joints or leakage visible on the tapes shall be corrected by the CONTRACTOR prior to final acceptance and payment by the OWNER.

C. Infiltration/Exfiltration Testing.

1. After completion of gravity sewer installation, all sections of pipe shall be infiltration or exfiltration tested. When groundwater is four feet (4') or more above the top of the pipe, an infiltration test will be performed. Any leakage shall be measured by a V-notch weir or similar flow measuring device. Allowable leakage is 50 gallons per day/inch diameter of pipe/mile of pipe length being tested. If groundwater is not at least four feet (4') above the top of the pipe, an exfiltration test is required. This is to be performed by plugging the manhole at the lower end of the section and filling it with water. Water depth or head of water on the section of pipe to be tested shall be four feet (4') or, if four feet (4') of head cannot be provided, to the top of the highest constraint diameter manhole section. Allowable exfiltration leakage is 50 gallons per day/inch diameter of pipe/mile of pipe length being tested. If leakage exceeds the maximum allowed, the leak must be located and repaired.

END OF SECTION

SECTION 33 31 00

SEWER BYPASS PUMPING

PART – GENERAL

1.01 DESCRIPTION OF WORK

- A. The work covered by this section consists of providing all labor, equipment, material, and supplies and performing all operations required to bypass pump sewage around a manhole or sewer section in which work is to be performed. The CONTRACTOR shall be prepared to bypass pump sewage as part of his operations. The CONTRACTOR shall provide all pumps, piping and other equipment necessary to accomplish bypass pumping; perform all construction; obtain all permits; pay all costs; and perform complete restoration of all existing facilities to conditions equal or better than existed prior to construction and to the satisfaction of the ENGINEER. All costs to accomplish bypass pumping, at the required volume, and all associated work including restoration, shall be considered incidental to the work and no additional compensation will be allowed.

1.02 GENERAL

- A. When the depth of flow in the sewer line being televised or repaired is above the maximum allowable for the proposed work, then the CONTRACTOR shall reduce the flow to the level shown below by manual operation of pump stations, plugging or blocking of the flow or by pumping and bypassing of the flow as acceptable to the ENGINEER. For manual operation of pump stations, the CONTRACTOR shall coordinate such operations with the appropriate City personnel. Plugging or blocking of the flow shall only be allowed when the CONTRACTOR can demonstrate that the upstream gravity collection system can accommodate the surcharging without any adverse impact.
- B. The depth of flow in the sewer line being televised or repaired shall not exceed that shown for the respective pipe sizes and for the operations indicated.
- C. Initial Television Inspection. For the initial television inspection, the sewer line shall be blocked completely. No flow, except infiltration, will be allowed through the sewer line.
- D. Television Inspection Before and After Lining Installation. For the television inspection before and after lining installation the sewer line shall be blocked completely. No flow, except infiltration before lining, will be allowed through the sewer line.
- E. Other Television Inspection, including Warranty.

Pipe Size	Maximum Depth of Flow
6" – 10" Pipe	20 Percent (20%) of Pipe Diameter
12" – 24" Pipe	25 Percent (25%) of Pipe Diameter
Above 24" Pipe	30 Percent (30%) of Pipe Diameter

- F. Television Inspection After Joint Testing/Sealing. For the television inspection after joint testing/sealing the sewer line shall be blocked completely. No flow will be allowed through the sewer line.

- G. Joint Testing/Sealing

Pipe Size	Maximum Depth of Flow
6" – 10" Pipe	20 Percent (20%) of Pipe Diameter
12" – 24" Pipe	30 Percent (30%) of Pipe Diameter
Above 24" Pipe	35 Percent (35%) of Pipe Diameter

- H. Pipe Lining Installation. For the pipe lining installation, the sewer line shall be blocked completely. No flow, except infiltration, will be allowed through the sewer line.
- I. Manhole Repairs. For manhole repairs, the flow through the manhole shall be controlled or blocked completely, as required, to properly complete the repairs as specified.

1.03 SUBMITTALS

The CONTRACTOR shall submit a written plan describing his means and methods for flow control and bypass pumping to the ENGINEER for review.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PLUGGING AND BLOCKING

- A. A sewer line plug shall be inserted into the line upstream of the section being televised or repaired. The plug shall be so designed that all or any portion of the upstream flow can be released. During the television inspections and repair operations the flow through the line being worked shall be reduced to within the maximum limits stated above. After the work has been completed, the flow shall be restored to normal.

3.02 PUMPING AND BYPASSING

- A. When pumping and bypass pumping is required, as determined by the ENGINEER, the CONTRACTOR shall supply all necessary pumps, conduits, and other equipment to divert the flow around manhole section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during rainstorm events. The CONTRACTOR will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. Pumps and equipment shall be continuously monitored by the CONTRACTOR during the periods that pumping and bypassing are required. If pumping is required on a 24-hour basis, engine shall be equipped in a manner to keep noise to a minimum.

3.03 FLOW CONTROL PRECAUTIONS

- A. When flow in a sewer line is plugged, blocked or bypassed by the CONTRACTOR, he shall take sufficient precautions to protect the public health and to protect the sewer lines from damage that might result from sewer surcharging. Further, the CONTRACTOR shall take precautions to insure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved and he shall be responsible for any damage resulting from his flow control operations.
- B. When flow in a sewer line is plugged or blocked by the CONTRACTOR, he shall monitor the conditions upstream of the plug and shall be prepared to immediately start bypass pumping, if needed. Any liquid or solid matter which is bypass pumped from the sewer collection system shall be discharged to another sewer manhole or appropriate vehicle or container only. No such liquid or solid matter shall be allowed to be discharged, stored, or deposited on the ground, swale, road, stormwater drainage system or open environment. The CONTRACTOR shall protect all pumps, conduit and other equipment used for bypass pumping from traffic.
- C. Should the liquid or solid matter from the sewer collection system be spilled, discharged, leaked, or otherwise deposited to the open environment as a result of the CONTRACTOR's flow control operations, he shall be responsible for all cleanup and disinfection of the affected area and all costs associated with same. The CONTRACTOR shall also be responsible for notifying the sewer system operating personnel and appropriate regulatory agencies and performing all required cleanup operations at no additional cost to the OWNER.

END OF SECTION

SECTION 33 32 20
COLLECTION SYSTEM SUBMERSIBLE PUMPS

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. The work included under this Section consists of furnishing submersible pumps, motors, and related equipment for the pump station as shown on the Drawings and specified herein. The station shall be fully tested, complete and in operating condition.

1.02 QUALITY ASSURANCE

- A. Unit Integrity: The pumps, motors, lifting cables, and guide bars shall be supplied by the pump supplier to ensure unit integrity.
- B. Pump Tests: The pump supplier shall perform the following tests on each pump before shipment from the supplier:
1. Megger the pump for insulation breaks or moisture.
 2. Prior to submergence, the pump shall be run dry and be checked for correct rotation.
 3. Pump shall be run in a submerged condition.
 4. Pump shall be removed from test tank and meggered immediately for moisture.
 5. A written certified test report giving the above information shall be supplied with each pump at the time of shipment.
 6. All end of pump cables will then be fitted with a rubber shrink fit boot to protect cable prior to electrical installation.
- C. Guaranteed Parts Stock Program: The pump supplier shall have a guaranteed parts stock program in the State of Florida. These parts shall include at least one (1) set of spare parts as listed below for each pump supplied on this contract. If the pump supplier does not have a published guaranteed part stock program, the CONTRACTOR shall furnish the specified spare parts for each pump.

Upper Mechanical Seal	Inspection Plug Washers
Lower Mechanical Seal	Impeller Bolt
Wear Rings	Impeller Key
Motor Cable	Upper Bearing
Cable Entry Washer/Grommet	Lower Bearing
Complete Set of O - Rings	

1.03 SUBMITTALS

- A. Shop Drawings: The CONTRACTOR shall submit detailed and dimensioned working shop drawings showing the construction of the proposed facility and installation of all equipment complete in every respect. Each drawing shall be indexed and/or referenced to the Contract Drawings and Specifications. No work upon the manufacture or fabrication of any equipment shall be performed until the ENGINEER's approval has been obtained. The CONTRACTOR shall submit, with the certified pump shop drawings, layout drawings showing exact installation, piping and foundation details for the pumping units being submitted.

1.04 WARRANTY

- A. The pump manufacturer shall provide a prorated warranty against defects in workmanship and materials for a period of five (5) years under normal use, operation, and service. The warranty shall be in published form and apply to all similar units.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. The pump manufacturer shall provide a prorated warranty against defects in workmanship and materials for a period of five (5) years under normal use, operation, and service. The warranty shall be in published form and apply to all similar units.

2.02 PUMPS

- A. The supplier shall furnish and install motor driven, totally submersible sewage pumps which meet the following requirements. Pumps shall be manufactured by ABS, or equal, as pre-approved by the design engineer of the lift station. See drawings for pump data.
- B. Pump Design: The heavy duty submersible wastewater pump(s) shall be capable of handling raw unscreened sewage, storm water, and other similar solids-laden fluids without clogging. The pump shall be driven by a **Premium Efficiency Motor**, providing the highest levels of operational reliability and energy efficiency.

GUIDE RAIL BASE ASSEMBLY (wet pit installation)

There shall be no need for personnel to enter the wet well to remove or reinstall the pump(s). In a wet pit installation, the discharge base & elbow assembly shall be permanently installed in the wet well and connected to the discharge piping. In order to prevent binding or separation of the pump from the guide rail system, the pump(s) shall connect to the guide rail base automatically and firmly, guided by two (2) two-inch (2") guide pipe extending from the base elbow to the top of the station. Systems using guide cable in lieu of rigid guide bars or pipes shall not be considered acceptable. The sliding guide bracket shall be a separate part of the pumping unit, capable of being attached to standard six inch (6") ANSI class 125 or metric DN150 pump flanges, so that the pump mounting is non-proprietary, and any pump with a standard discharge flange can be mounted on the base assembly. Base or bracket assemblies with proprietary or non-standard flange dimensions shall not be considered acceptable.

A field replaceable Nitrile (Buna-N) rubber profile gasket or O-ring shall accomplish positive sealing of the pump flange/guide rail bracket to the discharge elbow. Base assemblies which rely solely on metal to metal contact between the pump flange and discharge base elbow as a means of sealing are inherently leak prone, and shall not be equal. No portion of the pump shall bear directly on the floor of the sump. The guide rail system shall be available in an optional non-sparking version, approved by Factory Mutual for use in NEC Class 1, Division 1, Group C&D hazardous locations.

C. Pump Construction:

1. Major pump components shall be of gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B) with smooth surfaces devoid of porosity or other irregularities. All exposed fasteners shall be stainless steel 1.4401 (AISI type 316) construction. All metal surfaces coming into contact with the pumped media (other than the stainless steel components) shall be protected by a factory applied spray coating of zinc phosphate primer followed by a high solids two (2) part epoxy paint finish on the exterior of the pump. The pump shall be equipped with an open lifting hoop suitable for attachment of standard chain fittings, or for hooking from the wet well surface. The hoop shall be stainless steel 1.4401 (AISI 316), and shall be rated to lift a minimum of four times (4x) the pump weight.

Sealing design for the pump/motor assembly shall incorporate machined surfaces fitted with Nitrile (Buna-N) rubber O-rings. Sealing will be the result of controlled compression of rubber O-rings in two (2) planes of the sealing interface. Housing interfaces shall meet with metal to metal contact between machined surfaces, and sealing shall be accomplished without requiring a specific torque on the securing fasteners. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered equal. No secondary sealing compounds shall be

required or used.

2. **Impeller:** The ABS ContraBlock Plus impeller shall be of gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B). The impeller shall be of the semi-open, non-clogging, single vane design, meeting the Ten State Standards requirement for minimum solids passage size of three inches (3"). The impeller shall be capable of passing a minimum of 3.9 inch (3.9") diameter spherical solids as are commonly found in waste water. The impeller shall have a slip fit onto the motor shaft and drive key, and shall be securely fastened to the shaft by a stainless steel bolt which is mechanically prevented from loosening by a positively engaged ratcheting washer assembly. The head of the impeller bolt shall be effectively recessed within the impeller bore to prevent disruption of the flow stream and loss of hydraulic efficiency. The impeller shall be dynamically balanced to the ISO 10816 standard to provide smooth vibration free operation. Impeller designs which do not meet the Ten State Standards requirement for three inch (3") solids passage size, those that rely on retractable impeller designs to pass three inch (3") solids, or those that rely on fins or pins protruding into the suction path to assist in the handling of fibrous material shall not be considered equal.
3. **Self-Cleaning Wear Plate:** The ABS ContraBlock Plus wear plate shall be constructed from gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B). The wear plate shall be designed with an inlet incorporating strategically placed cutting grooves and an outward spiral V-shaped groove on the side facing the impeller, to shred and force stringy solids outward from the impeller and through the pump discharge. The wear plate shall be mounted to the volute with three (3) stainless steel securing screws and three (3) stainless steel adjusting screws to permit close tolerance adjustment between the wear plate and impeller for maximum pump efficiency. The wear plate shall be factory mounted to the volute in a fixed position with metal to metal contact on machined surfaces to insure optimal clearance and efficiency at startup. Future adjustments shall be easily accomplished by removing three (3) securing screws and rotating the plate 45 degrees (45°) to the adjustment position. Adjustment to allow for wear and restore peak pumping performance shall then be accomplished using standard tools, and without requiring disassembly of the pump. The use of fixed or non-adjustable wear plates or rings, or systems that require disassembly of the pump or shimming of the impeller to facilitate adjustment shall not be considered equal. The suction flange shall be integrated into the wear plate and its bolt holes shall be drilled and threaded to accept standard six inch (6") ANSI class 125 flanged fittings.
4. **Pump Volute:** The pump volute shall be single piece gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B) non-concentric design with centerline discharge. Passages shall be smooth and large enough to pass any solids which may enter the impeller. Discharge size shall be as specified on the

pump performance curve. The discharge flange design shall permit attachment to standard ANSI or metric flanges/appurtenances. The discharge flange shall be slotted to accept both six inch (6") ANSI class 125 and metric DN150 (PN 10) metric flanged fittings. Proprietary or non-standard flange dimensions shall not be considered acceptable. The minimum working pressure of the volute and pump assembly shall be 10 bar (145 psi).

D. PREMIUM EFFICIENCY MOTOR

The Premium Efficiency motor shall meet efficiency standards in accordance with IEC 60034-30, level IE3 and NEMA Premium*. Motor rating tests shall be conducted in accordance with IEC 60034-2-1 requirements and shall be certified accurate and correct by a third party certifying agency. A certificate shall be available upon request.

* IE3 and NEMA Premium efficiency levels are equivalent, however the NEMA Premium standard is intended to cover dry installed motors only, not integrated submersible motors.

The Premium Efficiency motor shall be housed in a water tight gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B) enclosure capable of continuous submerged operation underwater to a depth of 20 meters [65 feet (65')], and shall have an IP68 protection rating. The motor shall be of the squirrel-cage induction design, NEMA type B, Premium Efficiency. The copper stator windings shall be insulated with moisture resistant Class H insulation materials, rated for 18°C (356°F). The stator shall be press fitted into the stator housing. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is unacceptable. The rotor bars and short circuit rings shall be made of cast aluminum.

The motor shall be designed for continuous duty. The maximum continuous temperature of the pumped liquid shall be 40°C (104°F), and intermittently up to 50°C (122°F). The motor shall be capable of handling up to 12 evenly spaced starts per hour without overheating. The service factor (as defined by the NEMA MG1 standard) shall be **1.3**. The motor shall have a voltage tolerance of plus or minus 10 percent ($\pm 10\%$) from nominal, and a phase to phase voltage imbalance tolerance of one percent (1%). The motor shall be FM and CSA approved for use in NEC Class I, Division I, Groups C & D hazardous locations. The surface temperature rating shall be T3C.

For submerged (wet pit) applications, the motor shall be self-cooling via the process fluid surrounding the motor. For unsubmerged (dry pit) applications, an integrated oil cooling system shall be utilized to enhance heat transfer, and allow the motor to operate at full rated power continuously without the need for de-rating or reduced duty cycle. No external coolant supply or external cooling jacket shall be required for dry pit applications. The motor shall have a NEMA Class A temperature rise for

submerged service, and class B rise for dry pit service, providing cool operation under all operating conditions.

1. Thermal Protection: Each phase of the motor shall contain a normally closed bi-metallic temperature monitor switch imbedded in the motor windings. These thermal switches shall be connected in series and set to open at 140°C (284°F) plus or minus five degrees ($\pm 5^{\circ}\text{C}$). They shall be connected to the control panel, and used in conjunction with, and supplemental to, external motor overload.
2. Mechanical Seals: Each pump shall be equipped with a tandem mechanical shaft seal system consisting of two (2) totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one (1) stationary industrial duty **silicon-carbide** seal ring and one (1) rotating industrial duty **silicon-carbide** seal ring. The stationary ring of the primary seal shall be installed in a seal holding plate of gray cast iron EN-GJL-250 (ASTM A-48, Class 35B). The seal holding plate shall be equipped with swirl disruption ribs to prevent abrasive material from prematurely wearing the seal plate. The upper, secondary seal unit, located between the lubricant chamber and motor housing, shall contain one (1) stationary industrial duty **silicon-carbide** seal ring, and one (1) rotating industrial duty **silicon-carbide** seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall not require routine maintenance, or adjustment, and shall not be dependent on the direction of rotation for proper sealing. Each pump shall be provided with a lubricant chamber for the shaft sealing system which shall provide superior heat transfer and maximum seal cooling. The lubricant chamber shall be designed to prevent overfilling, and to provide lubricant expansion capacity. The drain and inspection plug shall have a positive anti-leak seal, and shall be easily accessible from the outside of the pump. The seal system shall not rely upon the pumped media for lubrication and shall not be damaged when the pump is run dry. Lubricant in the chamber shall be environmentally safe non-toxic material.

The following seal types shall not be considered equal: Seals of proprietary design, or seals manufactured by other than major independent seal manufacturing companies. Seals requiring set screws, pins, or other mechanical locking devices to hold the seal in place, conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces, any system requiring a pressure differential to seat the seal and ensure sealing.

3. Mechanical Seal Protection System: The primary mechanical seal shall be protected from interference by particles in the waste water, including fibrous materials, by an active Seal Protection System integrated into the impeller.

The back side of the impeller shall be equipped with a sinusoidal cutting ring, forming a close clearance cutting system with the lower submersible motor housing or seal plate. This sinusoidal cutting ring shall spin with the pump impeller providing a minimum of 75 shearing actions per pump revolution. Large particles or fibrous material which attempt to lodge behind the impeller, or wrap around the mechanical seal shall be effectively sheared by the active cutting system into particles small enough to prevent interference with the mechanical seal. The Seal Protection System shall operate whenever the pump operates, and shall not require adjustment or maintenance in order to function. Submersible pump designs which do not incorporate an active cutting system to protect the primary mechanical seal shall not be considered acceptable for wastewater service.

4. Seal Failure Early Warning System: The integrity of the mechanical seal system shall be continuously monitored during pump operation and standby time. An electrical probe shall be provided in a sensing chamber positioned between the primary and secondary mechanical seals for detecting the presence of water contamination within the chamber. The sensing chamber shall be filled with environmentally safe non-toxic oil. A solid-state relay mounted in the pump control panel or in a separate enclosure shall send a low voltage, low amperage signal to the probe, continuously monitoring the conductivity of the liquid in the sensing chamber. If sufficient water enters the sensing chamber through the primary mechanical seal, the probe shall sense the increase in conductivity and signal the solid state relay in the control panel. The relay shall then energize a warning light on the control panel, or optionally, cause the pump shut down. This system shall provide an early warning of mechanical seal leakage, thereby preventing damage to the submersible pump, and allowing scheduled rather than emergency maintenance. Systems utilizing float switches or any other monitoring devices located in the stator housing rather than in a sensing chamber between the mechanical seals are not considered to be early warning systems, and shall not be considered equal.
5. Shaft: The pump shaft and motor shaft shall be an integral, one (1) piece unit adequately designed to meet the maximum torque required at any normal start-up condition or operating point in the system. The shaft shall have a full shutoff head design safety factor of 1.7, and the maximum shaft deflection shall not exceed 0.05 mm [0.002 inch (0.002")] at the lower seal during normal pump operation. Each shaft shall be stainless steel 1.4021 (AISI 420) material, and shall have a polished finish with accurately machined shoulders to accommodate bearings, seals, and impeller. Carbon steel, chrome plated, or multi piece welded shafts shall not be considered adequate or equal.
6. Bearings: Each pump shaft shall rotate on high quality permanently lubricated, greased bearings. The upper bearing shall be a deep grooved ball bearing and the lower bearings shall be a heavy duty double row angular

contact ball bearing. Bearings shall be of sufficient size and properly spaced to transfer all radial and axial loads to the pump housing and minimize shaft deflection. L-10 bearing life shall be a minimum of 50,000 hours at flows ranging from one-half (1/2) of BEP flow to one and a half (1-1/2) times BEP flow (BEP is best efficiency point). The bearings shall be manufactured by a major internationally known manufacturer of high quality bearings, and shall be stamped with the manufacturer's name and size designation on the race. Generic or unbranded bearings from other than major bearing manufacturers shall not be considered acceptable.

- E. Power Cable: The power cables shall be sized according to NEC and CSA standards and shall be of sufficient length to reach the junction box without requiring splices. The outer jacket of the cable shall be oil and water resistant, and shall be capable of continuous submerged operation underwater to a depth of 65 feet (65').
- F. Cable Entry System: The cable entry system shall consist of a submersible plug assembly which allows the cable be easily disconnected from the pump for service or replacement. Cable sealing shall be accomplished by a Nitrile compression grommet with both cylindrical and conical sealing surfaces, flanked by a stainless steel washer and an integrated strain relief. A brass (C3604) compression nut shall be threaded into to the cast iron EN-GJL-250 (ASTM A-48, Class 35B) cable plug housing, compressing the grommet ID to the cable while the grommet OD seals against the bore of the cable entry housing. Cable conductors shall be terminated in copper pin connectors which are separated and retained by a circular pin retainer fabricated from high dielectric strength Polyamid [30 percent (30%) GF]. Each pin shall pass through its own hole in the pin retainer, maintaining perfect alignment with the mating pins in the motor body. The corresponding motor body pin assembly shall be manufactured from high dielectric strength Polyamid [30 percent (30%) GF], with copper connector pins. The pin assembly shall be sealed with an O-ring to prevent water entry into the motor, and retained in the motor housing bore via a retaining ring. Attachment of the plug assembly to the motor shall engage the corresponding copper pins, creating a complete circuit between the motor and cable. The plug assembly shall be fastened with stainless steel fasteners, and shall be sealed by an O-ring.

The cable plug and sealed entry system as part of the motor shall be FM and CSA approved for use in NEC Class I, Division I, Groups C & D hazardous locations. The system shall be anti-wicking by design, and shall prevent any water that enters the cable through damage to the jacket from entering the motor. Cable entry designs which utilize potting compounds to provide a water tight seal, or those which do not allow the cable to be easily changed in the field shall not be considered equal.

2.03 ACCESSORIES

- A. The pump manufacturer shall supply related pump accessories for the lift station as shown on the plan drawings.

1. Standard pump accessories may include, but not limited to, upper guides, rails, float brackets, floats, lift cables, lifting bails, anchor bolts, and hardware; all to be supplied in type 316 stainless steel materials.
2. The integral base elbows and pump rail brackets are to be construction of cast iron material.
3. The access covers are defined under Section 08 30 05.

2.03 CONTROL PANEL

A. GENERAL

1. The work included in this Section consists of furnishing all labor, equipment, tools, materials, and performing all operations required for furnishing control cabinet.
2. The Drawings are diagrammatic in character but should be adhered to as closely as possible consistent with fabrication of the control panel.
3. All work shall be executed in workmanlike manner by skilled personnel and the work shall present a neat and professional appearance when completed.
4. The term “provide” shall mean to furnish completely unless otherwise indicated.
5. The Vendor shall provide a detailed shop drawing.
6. In general, electrical materials and apparatus shall comply with all applicable tests, ratings, specifications, and requirements of the appropriate standards listed in section 1.02 herein. Underwriter’s Laboratories, Inc. (UL) listed electrical components or assemblies shall be used and shall bear the approved device label of UL, and conform to UL 508A standards. The standards herein are minimums; the Vendor may exceed such minimums with prior approval of the County.
7. All work shall comply with applicable requirements and recommendations of standards published by listed agencies and trade associations, except to the extent more detailed and stringent requirements are indicated or required by local governing regulations. The control cabinets furnished herein shall be fully FDEP compliant.
8. All work shall comply with the latest editions of the NEC, National Fire Protection Association NFPA 70, NFPA 79, the National Electrical Safety Code (NESC), and all applicable state, municipal, and local codes. Work

shall be subject to inspection and approval requirements of the local authority having jurisdiction.

9. Vendor shall guarantee all work and rectify any defects due to faulty materials or workmanship for a period of 18 months after delivery of control cabinet.

B. CONTROLS AND INSTRUMENTATION

1. The Duplex pump station control panel shall be designed for electric service as shown on the drawings. The panel shall also be designed for pumps as shown on the drawings. Across the line starters shall be used to start the pumps up to full speed and off as necessary to maintain level in the pump station, using pump controller and level sensor.
2. The duplex control panel shall be manufactured for Hydra Service USA, Sanford, Florida, or approved equal to these specifications. The panel shall be constructed in accordance with UL 508A requirements for enclosed industrial control panels and shall bear the serialized UL label, with all components being U/L listed or Recognized for use in Industrial Control Panels.

C. ENCLOSURE:

1. All controls for the station operation shall be enclosed in a single tamper-resistant, NEMA 3R 304 stainless steel enclosure. The outer door shall have three-point latch mechanism with roller bar and heavy duty lockable handle. The door shall be able to be held open position at 90 degrees (90° minimum) with mechanical latches. The panel shall be sufficiently large to accept all control components without crowding. Larger enclosures shall contain door and panel stiffeners as required.
2. The enclosure shall have a hinged full-height inner door fabricated from high quality aluminum 5052-H32 0.125-inch (0.125") thick, shall be powder coat Iron Gray Texture. All holes shall be in accordance with UL 508A to maintain proper fitting of devices, i.e. notches to prevent turning. All components exposed for access shall have symmetrical cut outs with clean and de-burred edges.
3. All circuit breakers, control switches, indicator lights and other control devices shall be identified permanently with etched engraving on the dead front cover of the control panel. The door shall have a continuous aluminum piano type hinge with two (2) twist type latches.
4. The enclosure shall have a twelve gauge steel, formed, removable subpanel. The subpanel shall be degreased, cleaned, treated with a phosphatizing

process, then primed and painted with white industrial grade baking enamel.

The enclosure and mounting system shall be designed to withstand wind loads as required by applicable building codes.

D. CONTROLS:

1. The panel shall consist of the following components:
 - a. Pump Controller with Operator Interface (one), spare controller (one).
 - b. Liquid Level Sensor (one).
 - c. Motor Starters (one per pump).
 - d. Thermal Magnetic Circuit Breaker (one per pump).
 - e. Manual Transfer Assembly (one interlocked Main and Emergency Breaker).
 - f. Control Transformer with Primary and Secondary Circuit Breaker protection (one).
 - g. Generator Receptacle (one).
 - h. Duplex Convenience Outlet, GFI (one).
 - i. HOA Selector Switches (one per pump, float backup, and panel light).
 - j. Elapse Time Meters (one per pump).
 - k. Pilot Lights:
 - 1) Run (one per pump - green).
 - 2) Seal Fail (one per pump - amber).
 - 3) Over-Temperature (one).
 - 4) Fault (one per pump - amber).
 - 5) Backup Float Enable (one - red).
 - 6) Control Power Available (one - green).

- 7) Alarm Light (one).
- 8) Audible Alarm (one).
- 9) Lightning/Surge Arrestor (one).
- 10) Moisture Sensors (one per pump).
- 11) Heat Sensors (one per pump).
- 12) Power/Phase Monitor (one).
- 13) Power Supply (one).
- 14) Work Lamp (one).

E. GENERAL COMPONENTS:

1. Pump Control Module: The pump control module shall be a controller that is designed for the wastewater industry and provides set point adjustment for starting and stopping of up to four (4) pumps, set points for low and high level alarms, and selection of lead pump alternation. It shall include a user-friendly operator interface to enter set points and see liquid level. It shall contain outputs for pumps/alarms, 4-20 mA input for level signals, and digital inputs for float switches. It shall also be capable of in/outflow pump capacity calculation and interfacing with SCADA and /or Telemetry systems via an RS 232 serial port. The pump control module shall be an MPE SC2000 controller or pre-approved equal.
2. Liquid Level Sensor: The primary liquid level sensor shall be a submersible pressure transducer that is designed for the wastewater industry. It shall be a submersible hydrostatic type with a 316L Stainless casing. The transducer element shall be made of ceramic material. The level sensor shall provide a 4-20 mA output signal proportional to liquid level. It shall also provide transient protection. The level sensor shall be an “ABS”, Model HSC2 pressure transducer or pre-approved equal.
3. Motor Starters: The panel shall contain a motor starter for each motor. The motor starter shall be across the line non-reversing magnetic starter with individual mechanical overload protection on each power leg with reset installed through the dead front inner door unit. The Motor Starters shall be “Square D”, series, or pre-approved equal.
4. Thermal Magnetic Circuit Breakers: The circuit breakers shall be quick-make, quick-brake and trip free. The thermal and magnetic elements shall operate independently and be designed with a common trip bar breaking all

poles when a fault is received on any pole. “H” frame circuit breakers shall contain a self-test “Trip Selector” permitting a mechanical simulation of the over current tripping device. Each circuit breaker shall be mounted with the handles extending through the inner door. The circuit breakers shall be “Square D” LAL, JDL, or HDL series, or pre-approved equal.

5. Manual Transfer Assembly: If an automatic generator is not specified, a manual transfer interlock assembly shall be supplied. The assembly shall provide one (1) normal power circuit breaker, one (1) emergency power circuit breaker and interlock to prevent both circuit breakers from being energized at the same time.
6. Generator Receptacle: A 100 amp Russell Stoll #JRS1044FR receptacle and JAAB10 angle adapter panel mounted receptacle and flap cover shall be provided. The generator receptacle shall not be required if generator set is installed.
7. Duplex Convenience Outlet: Provide a convenience outlet, duplex receptacle with integral ground fault interrupter, to be mounted on the inner door. The receptacle shall be rated 15A, 120VAC and shall be manufactured by “Hubbell”, or pre-approved equal.
8. HOA Selector Switches: A three (3)-position selector switch shall be provided for each pump. A two (2)-position selector switch shall be provided for the Backup Float Enable feature and the panel work lamp. These switches shall be 30 mm, NEMA 4X, maintained type switches. The HOA switches shall be manufactured by “Square D”, series 9001, KS12B, and KS43B, or pre-approved equal.
9. Elapse Time Meters: Five (5) digit, non-resettable elapse time meters interfaced with the appropriate motor starters shall be mounted on the inner door. One (1) time meter for each pump. The elapse time meter shall be ENM, model T-50, or pre-approved equal.
10. Pilot Lights: Pilot lights shall be provided to indicate run and alarm status of the pumps/motors and the use of the float backup system. The lights shall have a removable lens and replaceable lamp. The lights shall be 30 mm, NEMA 4, 120VAC, full voltage type. The pilot lights shall be “Square D”, series 9001, KP38G31, KP38A31, KP38R31, or pre-approved equal.
11. Alarm Light: A red strobe alarm light pipe mounted on the panels left side, unless otherwise shown on the drawings, shall be provided to indicate a high water condition. The unit shall consist of Ingram CTO15F-R strobe light, OLB one-half inch (1/2") conduit body, six inch (6") aluminum pipe, one-half inch (1/2") Myers hub, or pre-approved equal.

12. Audible Alarm: A Horn shall be provided to sound upon a high level condition. The horn shall be piezo type and shall be rated 45 db at 10 feet (10'). A silence pushbutton shall be mounted on the left side of the enclosure used to energize a relay to disconnect the horn when pressed. The silence pushbutton shall be individually labeled on the outside of the enclosure with a custom laser printed label that has been laminated for protection. The label color shall be white with black letters and black border. This label shall meet the requirements of the "Component Labels" section listed below. The pushbutton switch shall be 30 mm, NEMA 4X, flush type, black in color, and manufactured by "Square D", series 9001, KR1B, or pre-approved equal. The horn shall be a Federal Signal model 350-120-30 with trim ring (TR), or pre-approved equal.
13. Lightning/Surge Arrestor: A secondary arrestor, complying with UL 1449, 3rd Edition - latest, shall be installed on the line side of the main breaker in accordance with manufacturer's instructions. Arrestor shall be "Square D", model SDSA3650, or pre-approved equal.
14. Moisture Sensors: The panel shall be equipped with moisture sensing relays for each pump energizing red status indicator lights mounted on the inner door. The relays shall be "ECS" model 1110016, or pre-approved equal.
15. Heat Sensors: The panel shall be equipped to accept a thermal signal from each pump/motor. This signal shall shutdown the pump and energizes a red status indicator for the appropriate pump/motor.
16. Power/Phase Monitor: A power monitor relay shall be installed and connected to the control logic. When the relay is deactivated, it shall disconnect control power to the motor starters. The relay shall be deactivated in the event that any of the following conditions occur:
 - a. Phase loss (single phasing).
 - b. Phase reversal (sequence).
 - c. Low voltage (brown out).

The phase monitor relay shall be an "ORCO", model 001-230-1212 for 240VAC, 001-480-1212 for 480VAC, no equal.
17. Work Lamp: A work lamp shall be provided in the control panel. The work lamp shall be a fluorescent light fixture, 18 inches (18") wide, and have a single lamp. It shall be mounted inside of the top of the enclosure and centered from left to right. Mounting shall be welded studs mounted to the roof of the enclosure. Drilling holes into the roof of the enclosure will not be accepted. The work lamp shall be provided with a manual operator type, two

(2)-position switch (see HOA switches) located on the dead front and be labeled per the label specifications listed below. The work lamp shall be manufactured by “Utilitech”, part number 069486, or pre-approved equal.

18. Battery Backup: Include battery backup system with 12 pin socket, battery, and signal system. Battery to maintain pump controller and accessories for minimum four (4) hours.

F. MISCELLANEOUS REQUIREMENTS:

1. Wiring: All wiring shall be color-coded using MTW #16 AWG minimum. Control wiring shall be numbered/lettered at each end. Wire numbers/letters shall be Panduit shrink sleeve or pre-approved equal. All wiring shall be routed through a wiring duct system to provide wire protection and an organized appearance.

2. Terminals: A 10 pole terminal block mounted on a 30-degree (30°) angle shall be provided as a minimum for interface with field installed equipment for the ease of field connection. If additional terminals are required, then additional 10 pole terminals must be used to meet the additional requirements unless there are less than seven (7) additional terminals required. If less than seven (7) additional terminals are needed, then terminal blocks of lesser poles of the same brand may be used to make up the difference needed. Individual pole terminal blocks supplied to meet the total connections required will not be allowed.

Terminal blocks shall be mounted with a minimum of two inches (2") from both enclosure sides and a minimum of one inch (1") from the bottom of the enclosure for easy access to terminal screws.

3. Component Labels: All back panel components shall be labeled using UL approved yellow polyester laser/ink jet labels. The labels shall be manufactured by “Panduit”, part number series C100 - C200. The nameplates shall be etched or engraved for the inner door components and logos. The labeling system shall be computer controlled to provide logos, post-script type or custom designs.
4. Control Panel Label: The control panel shall be provided with a job name or pump station name/number nameplate. This nameplate shall be located on the front door of the enclosure. The nameplate shall be a laminated two (2)-part system using black letters on a white background providing protection against fading, peeling, or warping. The labeling system shall be computer controlled to provide logos, post-script type or custom designs. The use of engraved plastic type nameplates is not acceptable.
5. Warning Label: A “Danger!! High Voltage Inside” label shall be provided on the inner door of the enclosure. The label shall be a laminated two (2)-

part system using black letters on a goldenrod background providing protection against fading, peeling, or warping. This label shall meet the requirements of the “Component Labels” section listed above.

6. **Drawings/Schematics:** The control system shall have complete drawing/schematics using AutoCad®. The drawing shall have a complete Bill of Material, front panel view with component locations, sub-panel view with component locations and electrical schematic. References to the Bill of Material shall be located for each component. These drawings/schematics shall also be provided as laminated sheets that shall be affixed to the inside of the enclosure door.
7. **Print Pocket:** A plastic print pocket shall be provided and mounted on the inside of the front door for all stainless steel enclosures. This print pocket shall be mounted by welding three (3) threaded studs onto the inside of the front door of the enclosure. One (1) stud will be used for each side of the print pocket as well as one (1) used for the bottom edge of the print pocket. No self- tapping screws, adhesive tapes, or Velcro will be accepted for the mounting of the print pocket.
8. **Mounting Hardware:** All mounting hardware such as screws or bolts used in the manufacturing of the control panel shall be stainless steel. All holes in the back plate and dead front shall be drilled and tapped. No self-tapping screws, adhesive tapes, glues, epoxy, or Velcro will be accepted for the mounting of any hardware.

G. OPERATION:

1. **Duplex Operation:** Under normal conditions, the submersible transducer will provide a 4-20 mA output signal that is proportional to level to the pump controller. The pump controller will then provide signals to the starters to start the pumps up to full speed as needed to maintain the water level in the wet well. The pump controller will provide start and stop set points and alarm set points for all pumps. The pump controller will also provide alternation of the two (2) pumps to ensure equal runtime of all pumps. If the incoming flow exceeds the pump capacity of the lag pump, and the high-level float is activated a high-level alarm shall be activated on control panel visual and audible and by remote through the pump controller to alert maintenance personnel to the condition. A silence button shall be provided to turn off the horn, but the alarm beacon shall remain on until the high level condition is corrected. If the high-level float is activated for more than the time set on the backup float timer (10 sec.), control will transfer to float backup operation regardless of the position of the “Select Controller / Floats” switch. Control will remain on backup floats until manually reset.
2. **Redundant Float Backup Operation:** Four (4) Floats (off, lead, lag, and high)

shall be utilized to send a signal to the motor starters to operate the pump only if the level rises above the floats designated for the controller operation. Contingent upon wet well level, the lowest float shall signal the lead pump to shut down. Upon sump level rise, the next higher float shall signal the alternator to select and start a pump. If after the lead pump starts and the level continues to rise to the Lag Pump start contact, the float shall send a signal to the alternator to start the lag pump and both pumps shall run simultaneously. The level shall be lowered until the Stop Float is reached and the controller shall shutdown both the appropriate control contacts and the Alternator manufactured by Macromatic, ECS part number 1110011, or equal, will start and run the pumps simultaneously.

2.04 PUMP ACCESS HATCH

A. General

1. Door opening sizes, number, and direction of swing of door leaves, and locations shall be as shown on the Drawings. The Drawings shall indicate the clear opening requirements.
2. All doors shall be aluminum (mill finish) unless otherwise noted.
3. Openings larger than 42 inches (42") in either direction shall have double leaf doors.
4. Doors shall be designed for flush mounting and for easy opening from both inside and outside.
5. All doors shall be provided with an automatic hold-open arm with release handle.
6. Double leaf doors shall be provided with Type 316 stainless steel safety chains to go across the open sides of the door, when in the open position. Brackets shall be provided on the underside of the doors to hold the safety bars when not in use.
7. All hardware, including but not limited to, all parts of the latch and lifting mechanism assemblies, hold open arms and guides, brackets, hinges, springs, pins, and fasteners shall be Type 316 stainless steel.
8. Cylinder locks with keyway protected by a cover plug shall be provided with all hatches.
9. Door leafs shall be one-quarter inch (1/4") aluminum diamond plate, minimum, stiffened and designed for 300 psi.
10. Mill finish with bituminous coating finish applied to the exterior.

11. Hatches covers to be manufactured by USF Fabrication or Halliday.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The equipment shall be installed and mounted by the CONTRACTOR in accordance with the manufacturer's drawings and instructions. All equipment shall be installed as shown in the drawings and in accordance with the manufacturer's recommendations. Piping shall be run as shown on the plans and be connected to all units in a manner to prevent leakage of water or sewage. Any departures from the locations or arrangements of units or connections there to, as shown on the plans, shall be detailed by the CONTRACTOR and approval there of obtained from the ENGINEER.
- B. All units shall be factory assembled by the pump manufacturer.

3.02 MANUFACTURER'S FIELD SERVICES

- A. Manufacturer's Service Representative shall provide competent personnel for a period of one (1) day in one (1) trip to:
 - 1. Check installation of equipment.
 - 2. Provide start-up of equipment.
 - 3. Run specified tests (if any).
 - 4. Train personnel in operation and maintenance of equipment.

3.03 TESTING

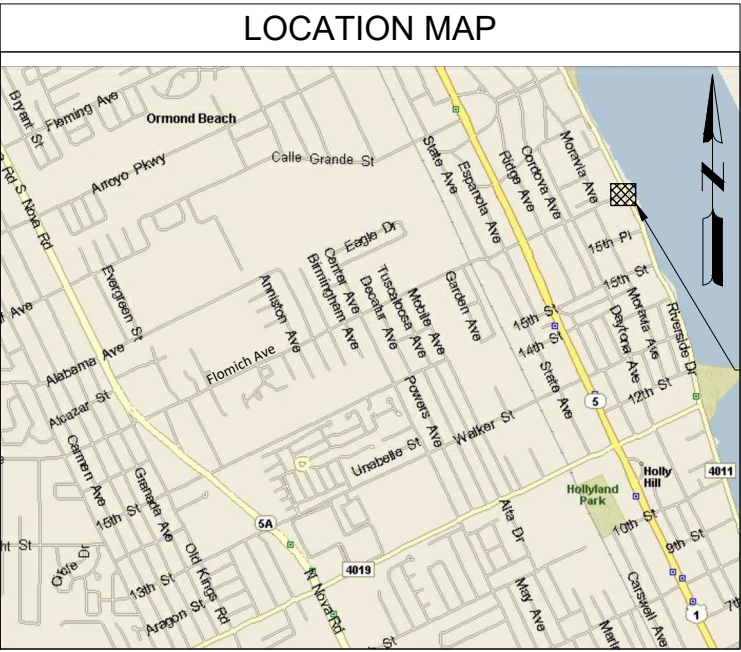
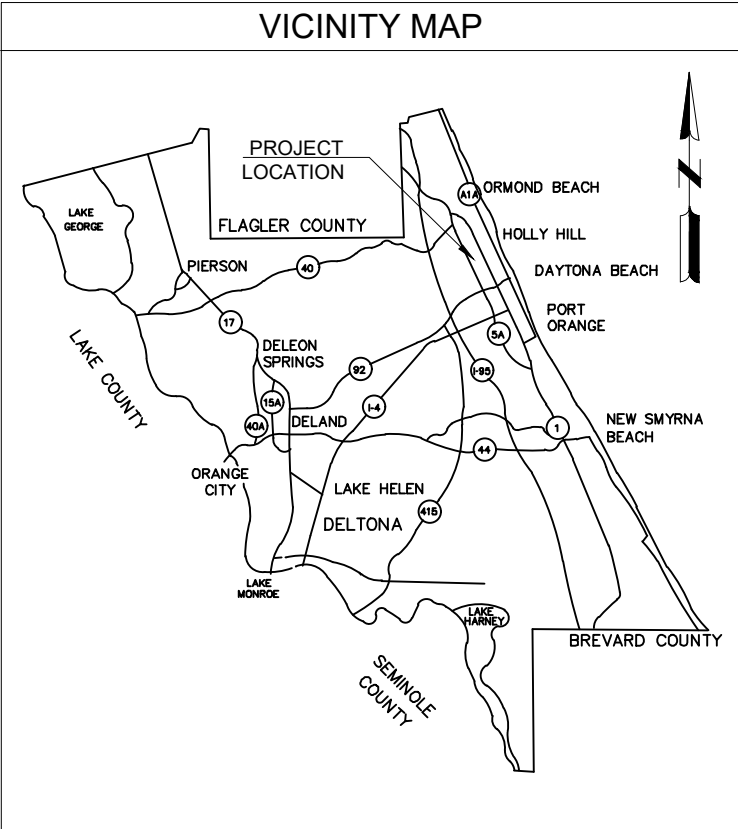
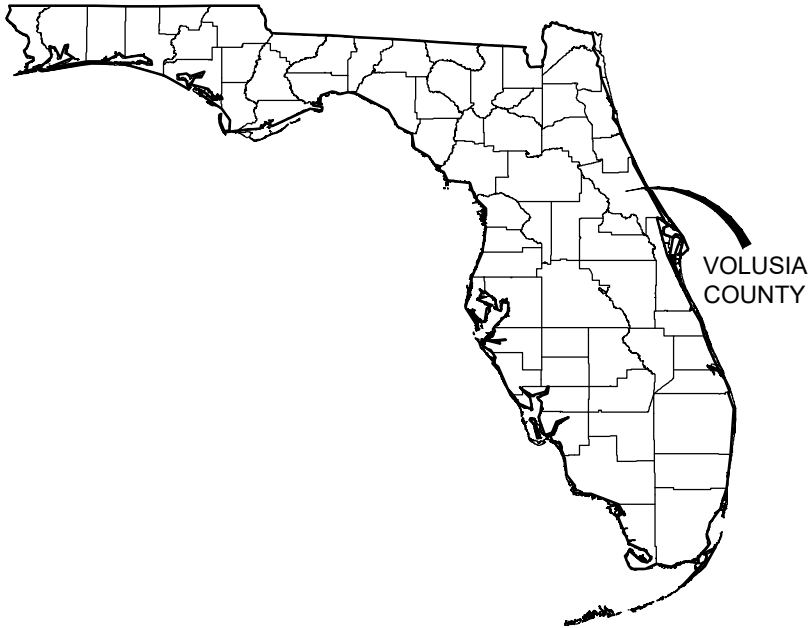
- A. After installation of the sewage pumps, the pumps shall be given a running test in the presence of the ENGINEER during which time they shall demonstrate their ability to:
 - 1. Perform without vibration or overheating at the specified conditions.
 - 2. Load test, check amperage, phase to voltage test and insulation test.
 - 3. Flow test based on timed drawdown of the wetwell and force main pressure.
- B. All defects revealed by or noted during the tests shall be corrected or equipment replaced promptly at no additional expense to the OWNER.

- C. CONTRACTOR shall furnish all labor, piping, equipment, and materials necessary for conducting the tests.
- D. In case the CONTRACTOR is unable to demonstrate to the satisfaction of the ENGINEER that the units will satisfactorily perform the service required, the units may be rejected. CONTRACTOR shall remove and replace the equipment, at his own expense.
- E. Prior to acceptance of the lift station, the as-built shop drawings, curves, details, and the operation and maintenance manuals shall be submitted. Provide, as a minimum, a set of four (4) manufacturer's manuals. In an effort to conserve environmental resources, and to minimize carbon footprint on the environment, an electronic file in PDF formatted manual can be supplied by email upon request.

END OF SECTION

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CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
BID # 20-WW-01
BID SET
FEBRUARY 2020



SHEET INDEX

SHEET NUMBER	SHEET TITLE
G-001	COVER SHEET
G-002	LEGEND & ABBREVIATIONS
G-003	GENERAL NOTES
G-041	SURVEY CONTROL PLAN
C-021	EROSION CONTROL PLANS
C-031	EROSION CONTROL DETAILS
C-041	DEMOLITION PLAN
C-141	LIFT STATION PLAN
C-501	LIFT STATION DETAILS
C-502	LIFT STATION DETAILS
C-503	MISCELLANEOUS DETAILS
C-504	SEWER CONSTRUCTION NOTES AND DETAILS
E-501	ELECTRICAL DETAILS

CITY OFFICIALS	
MAYOR	Chris Via
CITY MANAGER	Joseph Forte
COMMISSIONERS	
DISTRICT 1	John Penny
DISTRICT 2	Penny Currie
DISTRICT 3	John C. Danio
DISTRICT 4	Roy Johnson



7.1.b
Mead & Hunt
Mead and Hunt, Inc.
4401 Eastport Parkway
Port Orange, FL 32127
phone: 386-761-6810
meadhunt.com
FL Cert. #26730



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CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
FLOMICH STREET & RIVERSIDE DRIVE
HOLLY HILL, FL

ISSUED
02-19-2020 BID SET

NOT FOR CONSTRUCTION

M&H NO.: 1000710-191037.01
DATE: FEBRUARY 2020
DESIGNED BY: AMG
DRAWN BY: ADC
CHECKED BY: AEL
DO NOT SCALE DRAWINGS

SHEET CONTENTS
COVER SHEET

SHEET NO.

G-001
Packet Pg. 483

Attachment: HH Lift Station 9 Rehab BID SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

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SURVEYOR’S LEGEND:

A\C Air conditioning pad
A\U Aerial utilities
ACLRR Atlantic Coastline Railroad
CALC Calculation
CB Catch basin
CL Centerline
⊙ Cleanout
CM Concrete monument
CONC Concrete
Ⓢ Cable riser
Ⓢ Cable TV service
△ Delta
• Degree
DESC Description
Doc Document
E(LY) East(erly)
Ⓢ Electric meter
EMT Electrical metal tubing
FD Found
FLD Field
FPC Florida Power Corporation
FPLS Florida Professional Land Surveyor
Ⓢ Fire Hydrant
Ⓢ Gas meter
► Guy Anchor
Ⓢ Electric Service
IP Iron pipe
L Arc length

LB Licensed business
Ⓢ Mailbox
N(LY) North(erly)
NGVD National Geodetic Vertical Datum
PC Point of curve
PCP Permanent control point
POB Point of beginning
POC Point of commencement
PT Point of tangent
R Radius
R&C Rod and cap
REC Recovered
RLS Registered land surveyor
R/W Right of Way
S(LY) South(erly)
Ⓢ Storm manhole
Ⓢ Sign
Ⓢ Telephone service
TYP Typical
Ⓢ Utility pole
Ⓢ Utility services
Ⓢ Well
W(LY) West(erly)
Ⓢ Water meter
Ⓢ Water valve
Ⓢ Light Pole

TREE LEGEND:

Ⓢ PALM
Ⓢ OAK
Ⓢ PINE
Ⓢ SHRUB

NOTE:
Number beside tree indicates
diameter at breast height.(DBH)

SURVEYOR’S NOTES:

1. Field Survey completed 1/8/19.
2. Elevations are North American Vertical Datum 1988.
3. Underground utilities were not located except as shown.
4. No title search has been performed by or provided to MYER LAND SURVEYING.
5. Dimensions shown are feet and decimals thereof.
6. State Plane Coordinat es are North American Datum 1983, Florida East Zone
7. According to TECO People’s Gas there is no underground gas service in this vicinity.
8. Florida Power and Light Company and ATT did not respond to underground utility information request.
9. Contractor is advised to request One–Call locate before excavation.
10. Bearing basis is Grid, Florida East Zone N26°49’29”W along Riverside Drive.
11. Drawing revised 02–11–2019 to add storm manhole information and 3 palm trees.

UTILITY INFORMATION PROVIDED TO OR COLLECTED BY MEAD & HUNT DURING DESIGN										
UTILITY TYPE	UTILITY COMPANY	CONTACT	PHONE	E-MAIL	PRELIMINARY PLANS PROVIDED TO UTILITY (DATE)	INFORMATION QUALITY LEVEL AND DATE RECEIVED				FINAL PLANS PROVIDED TO UTILITY (DATE)
						LEVEL A/4	LEVEL B/3	LEVEL C/2	LEVEL D/1	
WATER	CITY OF HOLLY HILL	ANTOINE KHOURY	(386) 248-9493	akhoury@hollyhillfl.org	4/3/19					
WASTEWATER	CITY OF HOLLY HILL	ANTOINE KHOURY	(386) 248-9493	akhoury@hollyhillfl.org	4/3/19					
ELECTRIC DISTRIBUTION	FPL	SHAVONTI ARCHER	(386) 586-6432	shavonti.archer@fpl.com	4/3/19			5/1/19		
ELECTRIC TRANSMISSION	FPL	RALPH DIAZ	(561) 904-3617	ralph.diaz@fpl.com	4/3/19			4/10/19		
PHONE	AT&T FLORIDA	KIRBY SPENCER	(386) 257-7930	ks2488@att.com	4/3/19					
TV CABLE	BH NETWORKS / SPECTRUM	STACY STAFFORD	(386) 527-6836	stacy.stafford@charter.com	4/3/19					
GAS	TECO PEOPLES GAS	HEATH M MCARDLE	(904) 443-7317 (904) 545-8958	hmmcardle@tecoenergy.com	4/3/19			4/10/19		
SIGNALIZATION	n/a									
F.O. CABLE	CENTURY LINK / LEVEL 3	XAN MARIE RYPKEMA	(720) 888-7568	xan.rypkema@centurylink.com	4/3/19					
F.O. CABLE	CROWN CASTLE FIBER		(855) 933-4237		4/3/19					

CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT

FLOMICH STREET & RIVERSIDE DRIVE
HOLLY HILL, FL

ISSUED

02-19-2020

BID SET

NOT FOR CONSTRUCTION

M&H NO.: 1000710-191037.01
DATE: FEBRUARY 2020
DESIGNED BY: AMG
DRAWN BY: ADC
CHECKED BY: AEL
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SHEET CONTENTS

LEGEND &
ABBREVIATIONS

SHEET NO.

I:\CORP.MEADHUNT.COM\SHARED\FOLDERS\ENTP\10007101191037.01\TECH\CAD\DRAWINGS\G-003 GENERAL NOTES.DWG
2/20/2020 4:58:10 PM

GENERAL NOTES

1.

PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL REVIEW THE CITY OF HOLLY HILL UTILITIES DEPARTMENT STANDARD DETAILS, LATEST EDITION AND TECHNICAL SPECIFICATIONS AND COMPLY WITH THE REQUIREMENTS UNLESS OTHERWISE NOTED IN THE PLANS.
2.

GRADES SHOWN ARE EXISTING GRADES, AS GATHERED BY SURVEYOR.
3.

ALL STATIONS AND OFFSETS REFER TO CENTERLINE CONSTRUCTION UNLESS OTHERWISE NOTED IN PLANS.
4.

ALL UNDERGROUND UTILITIES HAVE NOT BEEN LOCATED. HORIZONTAL AND VERTICAL DATA IS BASED ON THE BEST INFORMATION AVAILABLE AND SHOULD BE CONSIDERED APPROXIMATE. IT IS POSSIBLE THAT CERTAIN UTILITIES MAY EXIST WHICH ARE NOT SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CALLING IN LOCATES AND LOCATING ALL UTILITIES PRIOR TO CONSTRUCTION WORK STARTING.
5.

INDIVIDUAL UTILITY OWNERS SHALL BE RESPONSIBLE FOR ANY UTILITIES TO BE ADJUSTED BY OTHERS AS DIRECTED BY THE CITY'S REPRESENTATIVE FOR THE CONSTRUCTION OF THIS PROJECT.
6.

THE CONTRACTOR SHALL NOTIFY ALL UTILITY OWNERS TWO (2) BUSINESS DAYS PRIOR TO ANY EXCAVATION. (CALL SUNSHINE 811).

APPARENT UTILITY OWNERS:

BH NETWORK/SPECTRUM.....(386) 760-9941x7126

TECO PEOPLES GAS INC.....(386) 671-2253

VOLUSIA COUNTY.....(386) 671-8815

AT&T.....(386) 257-7930

FLORIDA POWER & LIGHT.....(386) 322-3439

VOLUSIA COUNTY SIGNAL SHOP.....(386) 736-5968

CROWN CASTLE FIBER.....(305) 522-2931

CITY OF HOLLY HILL.....(386) 248-9463

7.

ALL WORK PERFORMED ON ANY UTILITY SYSTEM OR SYSTEM COMPONENT THAT IS OWNED OR PROPOSED TO BE OWNED BY THE CITY SHALL BE PERFORMED BY AN EXPERIENCED UNDERGROUND UTILITY CONTRACTOR LICENSED IN THE STATE OF FLORIDA AND REGISTERED WITH THE CITY.

8.

ALL PUBLIC LAND CORNERS AND NGVD MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED. IF A PUBLIC LAND CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE PROJECT ENGINEER SHOULD NOTIFY THE CITY SURVEYOR WITHOUT DELAY BY TELEPHONE. IT SHALL BE THE CONTRACTOR'S FULL RESPONSIBILITY TO REPLACE/RESTORE ANY PROPERTY CORNER DISTURBED BY CONSTRUCTION ACTIVITIES. IF AN NGVD MONUMENT WITHIN THE LIMITS OF CONSTRUCTION IS IN DANGER OF BEING DISTURBED THE CONTRACTOR SHALL NOTIFY:

GEODETTIC INFORMATION CENTER

ATTN: MARK MAINTENANCE SECTION

6001 EXECUTIVE BOULEVARD

ROCKVILLE, MARYLAND 20852

TELEPHONE: (301) 443-8319

9.

B.M. DATUM IS NATIONAL GEODETTIC VERTICAL DATUM OF 1988 (NGVD-1988) AND STATE PLANE COORDINATES ARE BASED UPON NAD 83.

10.

ALL DISPLACED SIGNS SHALL BE RELOCATED IN EQUAL OR BETTER THAN PRE-CONSTRUCTION CONDITION AT THEIR EXISTING STATION ACCORDING TO F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS (LATEST EDITION) UNLESS OTHERWISE NOTED IN THE PLANS.

11.

SIGNS THAT ARE REMOVED AND ARE TO BE RELOCATED SHALL BE STOCK PILED BY THE CONTRACTOR. ANY EXISTING SIGNS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT HIS COST.

12.

ALL EXISTING DRAINAGE STRUCTURES AND UTILITIES WITHIN THE CONSTRUCTION LIMITS SHALL REMAIN, UNLESS OTHERWISE NOTED IN PLANS.

13.

ALL STORM SEWER LINES AND INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIALS AT LAST STAGES OF CONSTRUCTION.

14.

ANY DRAINAGE PROBLEMS CREATED BY CONSTRUCTION, OR EXISTING BEFORE CONSTRUCTION AND NOT ALLEVIATED, SHOULD BE BROUGHT TO THE ATTENTION OF THE CITY OF HOLLY HILL PUBLIC WORKS DEPARTMENT AT THE TIME OF DISCOVERY.

15.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS AS WELL AS THE REQUIREMENTS OF ST. JOHNS RIVER WATER MANAGEMENT DISTRICT. CONTRACTOR SHALL ESTABLISH BEST MANAGEMENT AND EROSION CONTROL METHODS PRIOR TO COMMENCING ANY SITE CLEARING OR DEMOLITION AND SHALL MAINTAIN THOSE BARRIERS UNTIL FINAL ACCEPTANCE OF THE PROJECT. INLETS SHALL BE PROTECTED FROM RECEIVING SILTY RUNOFF BY MEANS ACCEPTABLE TO THE CITY.

16.

ALL DELINEATED WETLAND AREAS SHALL BE STAKED AND FENCED WITH TYPE III SILT FENCING PRIOR TO CONSTRUCTION. FENCING SHALL NOT BE REMOVED UNTIL ALL CONSTRUCTION IS COMPLETED. LIMITS OF SILT FENCE SHOWN ON PLANS ARE APPROXIMATE AND ARE TO BE ADJUSTED AS NECESSARY TO MEET FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
17.

THE EROSION, SEDIMENT, AND TURBIDITY CONTROL MEASURES DELINEATED HEREON ARE THE MINIMUM REQUIRED. ADDITIONAL CONTROLS MAY BE NEEDED, DEPENDING UPON THE ACTUAL SITE CONDITIONS, JURISDICTIONAL AGENCY PERMIT REQUIREMENTS AND CONSTRUCTION OPERATIONS. STAKED SILT FENCE SHALL BE UTILIZED TO CONTROL EROSION AND RELEASE OF SUSPENDED SOLIDS AND SEDIMENT TRACKING CONTROL DEVICES SHALL BE USED TO PREVENT THE OFFSITE TRANSPORT OF SEDIMENT BY MOTORIZED VEHICLES. IF CONTROL MEASURES DO NOT PROVE SATISFACTORY, WORK SHALL CEASE UNTIL NEW MEASURES ARE ADOPTED WITH SATISFACTORY RESULTS.

18.

ALL EROSION AND SEDIMENT TRACKING CONTROL DEVICES SHALL BE INSPECTED DAILY AND IMMEDIATELY FOLLOWING A RAINFALL EVENT. ANY DEFICIENCIES FOUND IN THE EROSION CONTROL MEASURES SHALL BE REPAIRED IMMEDIATELY. THE CONTRACTOR SHALL KEEP A LOG BOOK DOCUMENTING THESE DAILY INSPECTIONS, DEFICIENCIES AND REMEDIAL ACTIONS.

19.

ALL UNSUITABLE SOILS AND UNSUITABLE MATERIALS (SUCH AS CLAY, ORGANICS, ROCK, CEMENTED COQUINA, DEBRIS, ETC...) SHALL BE REMOVED, DISPOSED OF AND REPLACED WITH DRY COMPACTED GRANULAR MATERIAL SATISFACTORY TO THE CITY. THE COST OF THE WORK AND MATERIALS IS TO BE INCLUDED IN THE UNIT PRICE OF THE ASSOCIATED PAY ITEMS. ROCK EASILY MOVED WITH A STANDARD EXCAVATOR AND ABLE TO BE COMINGLED WITH BACKFILL MATERIAL SHALL NOT BE ELIGIBLE FOR UNSUITABLE MATERIAL PAYMENT.

20.

ROCK AND CEMENTED COQUINA OR OTHER MATERIALS UNSUITABLE FOR BACKFILL SHALL BE DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

21.

MAINTENANCE OF TRAFFIC: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING VEHICULAR AND PEDESTRIAN TRAFFIC SAFELY THROUGH THE WORK ZONE AT ALL TIMES. ANY SIDEWALK, LANE OR ROAD CLOSURE REQUIRES REVIEW AND APPROVAL IN ADVANCE AND A SEVEN (7) DAY MINIMUM NOTICE TO THE CITY OF HOLLY HILL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REQUIRED COORDINATION.

22.

MAINTENANCE OF TRAFFIC WILL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS" AND "THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS" LATEST EDITIONS.

23.

ALL WATER MAIN OUTAGES FOR TIE-INS SHALL BE COORDINATED WITH THE CITY OF HOLLY HILL. OUTAGES SHALL BE LIMITED TO TWO HOURS DURING WORKING HOURS. OUTAGES MAY BE EXTENDED DURING OFF PEAK TIMES WITH APPROVAL FROM THE CITY.
- 7.1.b

Mea
& Hunt

Mead and Hunt, Inc.
4401 Eastport Parkway
Port Orange, FL 32127
phone: 386-761-6810
meadhunt.com
FL Cert. #26730

HOLLY HILL
FLORIDA

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CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT

FLOMICH STREET & RIVERSIDE DRIVE
HOLLY HILL, FL

ISSUED
02-19-2020

BID SET

NOT FOR CONSTRUCTION

M&H NO.: 1000710-191037.01

DATE: FEBRUARY 2020

DESIGNED BY: AMG

DRAWN BY: ADC

CHECKED BY: AEL

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SHEET CONTENTS
GENERAL NOTES

SHEET NO.

G-003

Packet Pg. 485

Attachment: HH Lift Station 9 Rehab BID SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)



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4401 Eastport Parkway
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CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT

FLOMICH STREET & RIVERSIDE DRIVE
HOLLY HILL, FL

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SHEET CONTENTS
SURVEY CONTROL
PLAN

SHEET NO.

G-041

Packet Pg. 486

Attachment: HH Lift Station 9 Rehab Bid SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

Elizabeth Raulerson Sub of The
Hernandez Grant
(MB 17 Pg 95)
(MB 2 Pg 108)

Sanitary Sewer Man
Hole
Top Elevation 5.57'
8" PVC
Wly Inv.-5.24'
Wly Inv.-0.61'
Nly Inv.-5.41'
Ely Inv.-5.26'
8" Metal Pipe
Sly Inv.-3.66'

Lift Station
6' Diameter Wet Well
Top Elevation 6.16'
8" PVC Wly Inv.-5.30
Bottom Elev.-8.14'

Residence
#1601

Set 1/2" R&C
LB #6877

Underground
Fuel Storage

Planter

Dry Well 8'
Diameter
Underground
Pump Room
Bottom Floor
Elev. -7.42'

Bench Mark
Mag Nail & Disk
LB #6877
Elev. 5.84'
1790060.78342
643036.15124
0+86.89 19.29 Rt

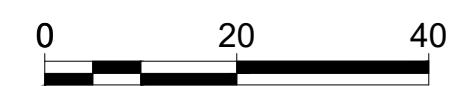
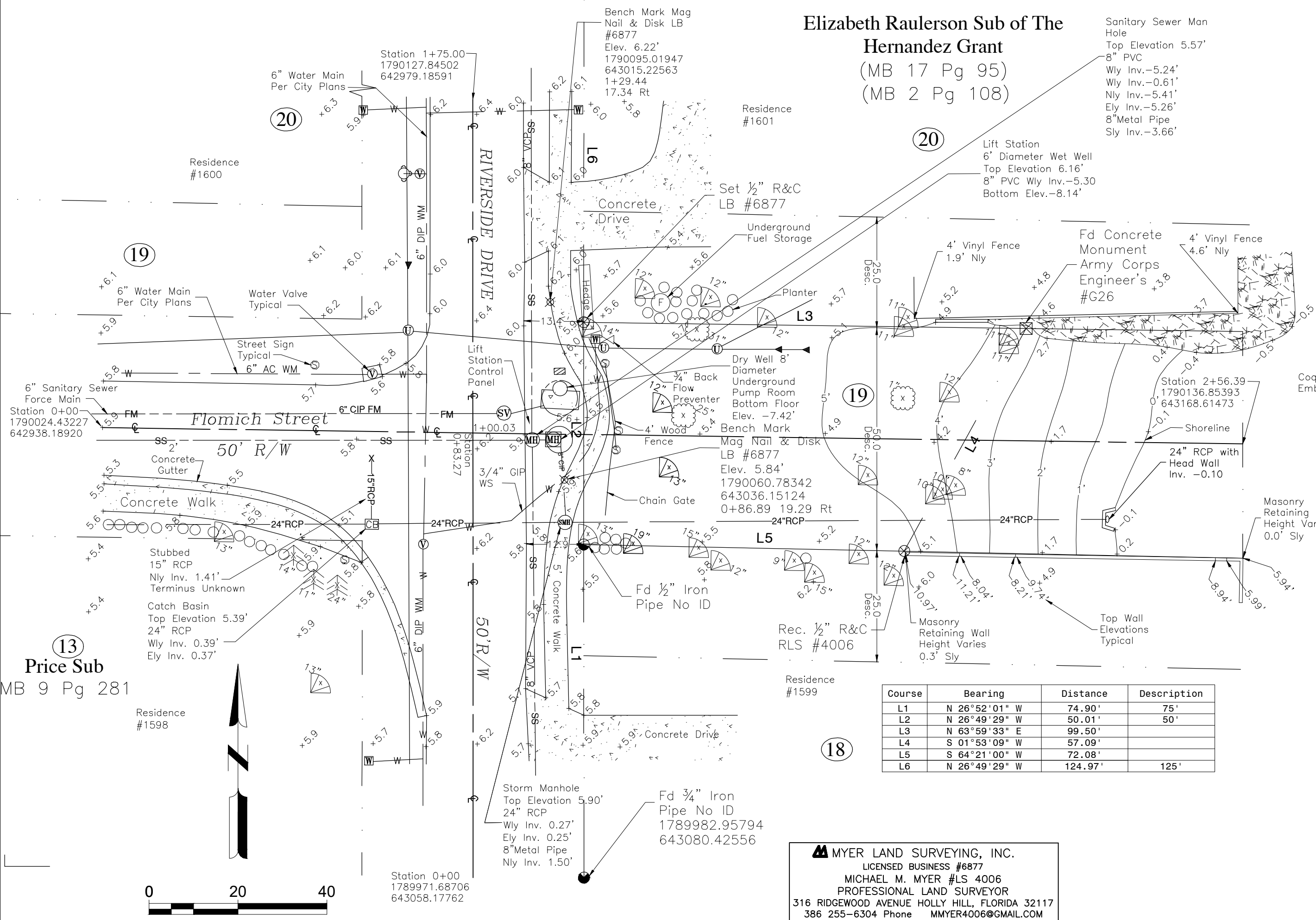
24"RCP

Rec. 1/2" R&C
RLS #4006

Residence
#1599

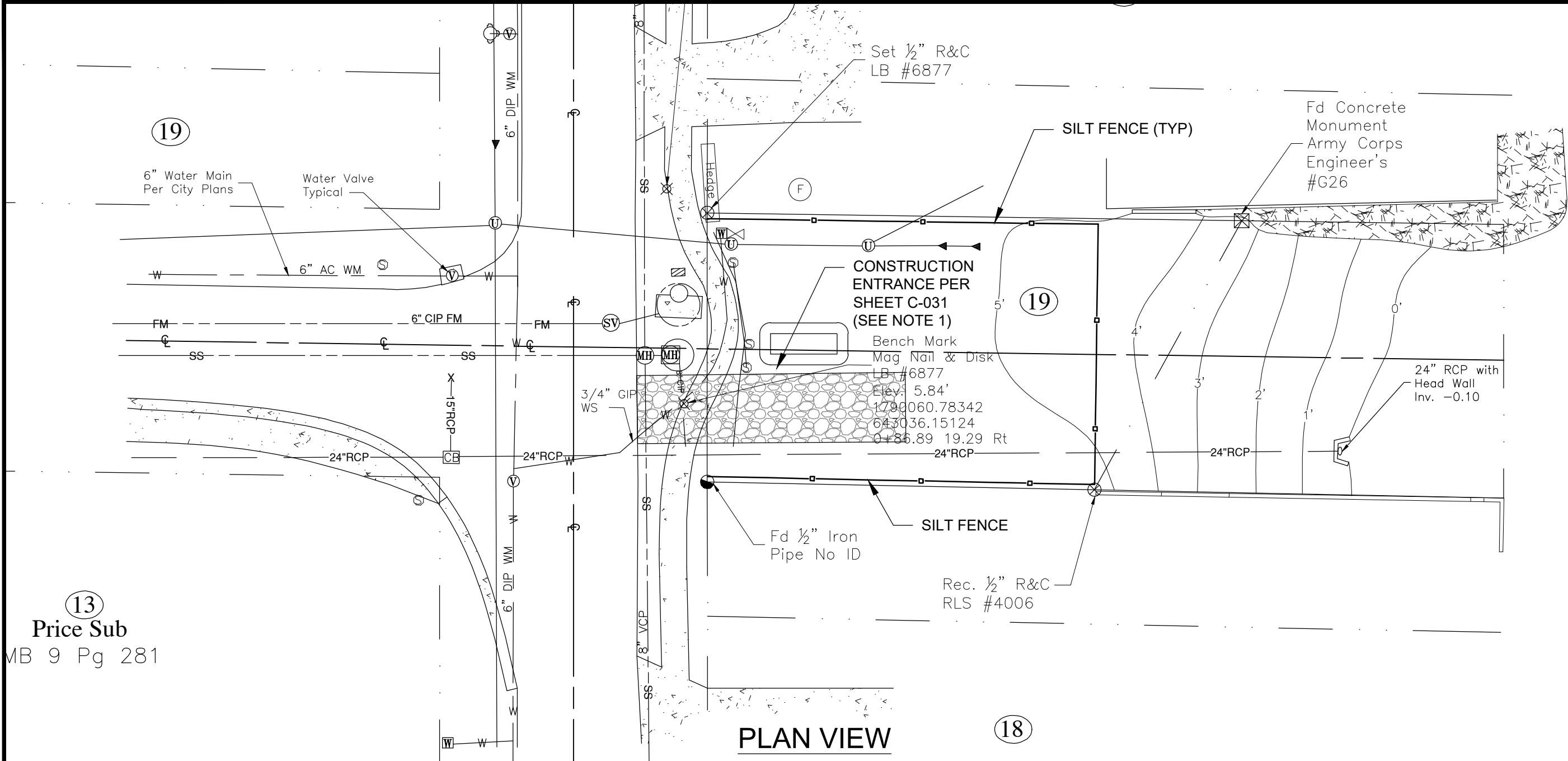
Course	Bearing	Distance	Description
L1	N 26°52'01" W	74.90'	75'
L2	N 26°49'29" W	50.01'	50'
L3	N 63°59'33" E	99.50'	
L4	S 01°53'09" W	57.09'	
L5	S 64°21'00" W	72.08'	
L6	N 26°49'29" W	124.97'	125'

MYER LAND SURVEYING, INC.
LICENSED BUSINESS #6877
MICHAEL M. MYER #LS 4006
PROFESSIONAL LAND SURVEYOR
316 RIDGEWOOD AVENUE HOLLY HILL, FLORIDA 32117
386 255-6304 Phone MMYER4006@GMAIL.COM



\\CORP.MEADHUNT.COM\SHARED\FOLDERS\ENTP\1000710\191037.01\TECH\DRAWINGS\G-041 SURVEY CONTROL PLAN.DWG
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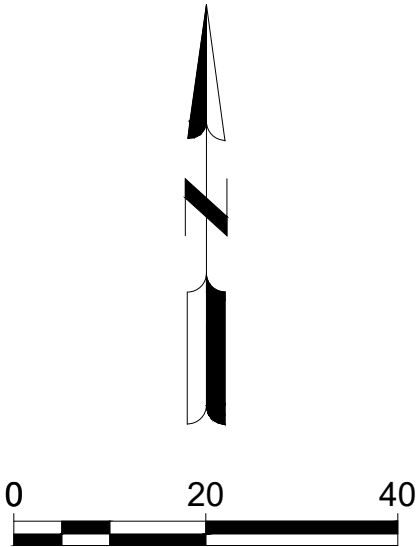


13
Price Sub
MB 9 Pg 281

NOTE:
1. CONTRACTOR TO PROVIDE GRAVEL.

LEGEND

- 6" THICK NO. 4 STONE ON FILTER FABRIC FOR TIRE SCRUBBING
- SILT FENCE
- TURBIDITY BARRIER
- SEDIMENT COLLECTION AREA



7.1.b

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HOLLY HILL
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CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
FLOMICH STREET & RIVERSIDE DRIVE
HOLLY HILL, FL

ISSUED
02-19-2020 BID SET

NOT FOR CONSTRUCTION

M&H NO.: 1000710-191037.01
DATE: FEBRUARY 2020
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SHEET CONTENTS
EROSION CONTROL
PLANS

SHEET NO.

C-021
Packet Pg. 487

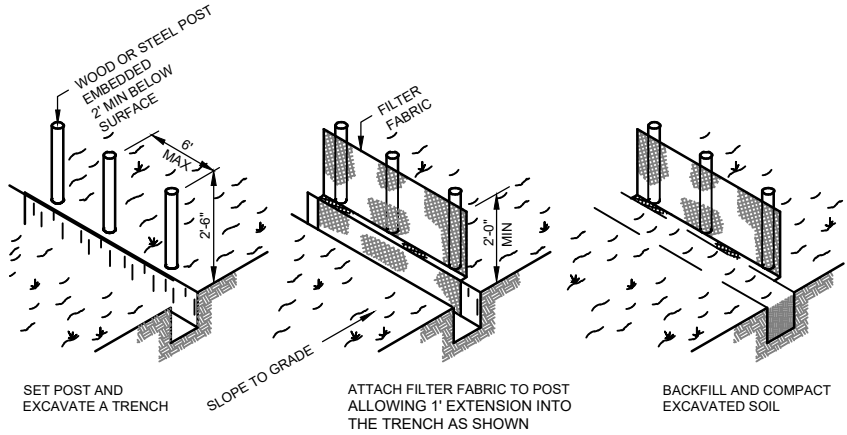
Attachment: HH Lift Station 9 Rehab BID SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

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SEDIMENT AND EROSION CONTROL NOTES:

EROSION AND SEDIMENT CONTROL MEASURES SHALL COMPLY WITH MINIMUM STANDARDS ADAPTED IN THE STORMWATER MANAGEMENT CRITERIA ADOPTED BY THE CITY AND ST JOHNS RIVER WATER MANAGEMENT DISTRICT. SOME OF THESE STANDARDS ARE AS FOLLOWS:

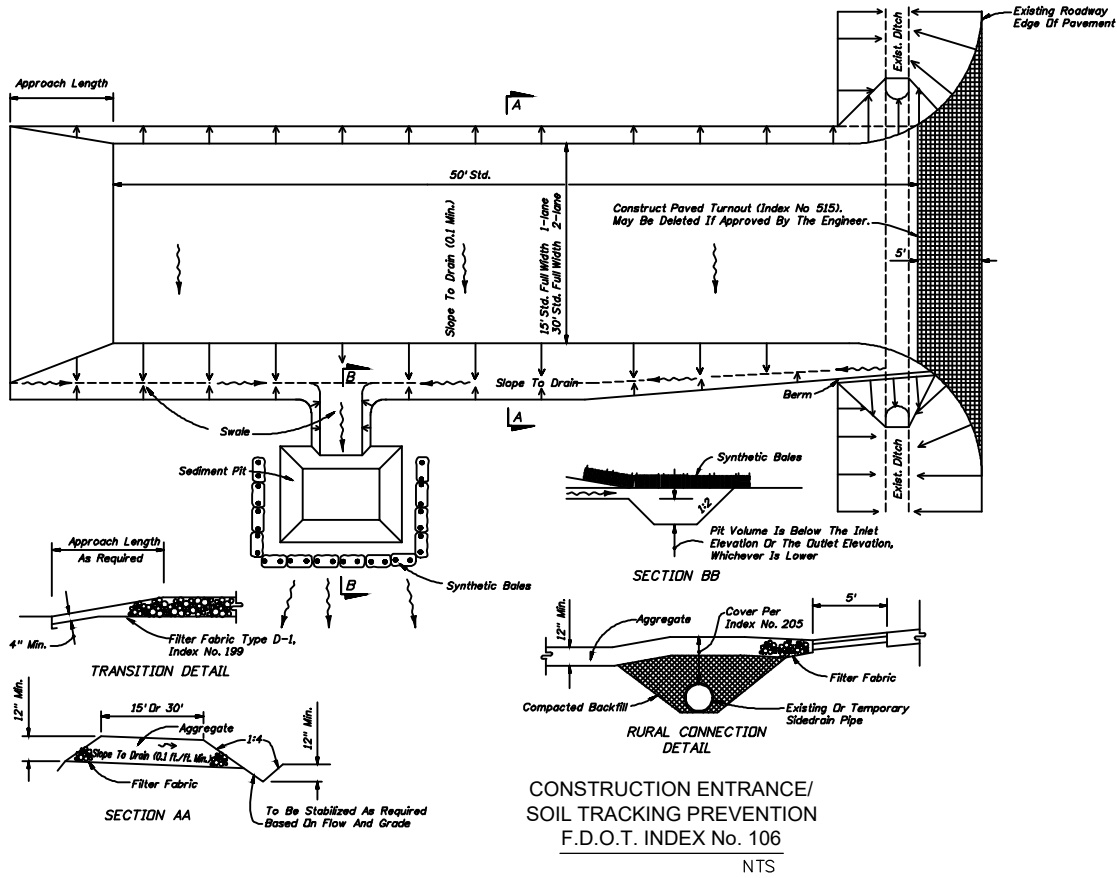
1. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UP-SLOPE LAND DISTURBANCE TAKES PLACE.
2. ALL SEDIMENT CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON BALANCE OF SITE. PERIMETER SEDIMENT BARRIERS SHALL BE CONSTRUCTED TO PREVENT SEDIMENT OR TRASH FROM FLOWING OR FLOATING ONTO ADJACENT PROPERTIES.
3. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN UNDISTURBED FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT UNDISTURBED FOR MORE THAN ONE YEAR.
4. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORMLY MATURE ENOUGH TO SURVIVE AND INHIBIT EROSION.
5. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE SEDIMENT BASIN SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE THE ANTICIPATED SEDIMENT LOADING FROM THE LAND-DISTURBING ACTIVITY. THE OUTFALL DEVICE OR SYSTEM DESIGN SHALL TAKE INTO ACCOUNT THE TOTAL DRAINAGE AREA FLOWING THROUGH THE DISTURBED AREA TO BE SERVED BY THE BASIN.
6. AFTER ANY RAINFALL, SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
7. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
8. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
9. SEDIMENT WILL BE PREVENTED FROM ENTERING ANY STORM DRAIN SYSTEM, DITCH OR CHANNEL. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
10. BEFORE TEMPORARY OR NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNELING SHALL BE IN- STALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
11. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA DURING CONSTRUCTION.
12. THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.
13. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES MUST BE PROVIDED TO ENSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE DEVELOPER, OWNER AND/OR CONTRACTOR SHALL BE CONTINUALLY RESPONSIBLE FOR ALL SEDIMENT LEAVING THE PROPERTY. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
14. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISION SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY TRACKING ONTO THE PAVED SURFACE. THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY.
15. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
16. PROPERTIES AND WATERWAYS DOWNSTREAM FROM CONSTRUCTION SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION AND EROSION.



NOTES:

1. MATERIALS, CONSTRUCTION METHODS AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND DESIGN STANDARDS CURRENT EDITION.
2. CONTRACTOR SHALL PROVIDE SILT FENCES AND HAY BALES AT ALL STORM WATER DISCHARGE POINTS FOR EROSION CONTROL AND SEDIMENT CONTROL DURING CONSTRUCTION.
3. CONTRACTOR SHALL ROUGH GRADE STORM WATER SWALES AND RETENTION AREAS PRIOR TO CONSTRUCTION OF SITE IMPROVEMENTS.
4. CONTRACTOR SHALL MEET ALL PERMIT CONDITIONS AS ESTABLISHED BY ALL APPLICABLE AGENCIES, INCLUDING BUT NOT LIMITED TO COUNTY, FDOT, AND THE SJRWMD.

SILT FENCE TURBIDITY BARRIER
N.T.S.



NOTES:

1. CONTRACTOR SHALL SUBMIT A DESCRIPTION OF THE PROPOSED SOIL TRACKING PREVENTION PLAN FOR THE ENGINEER'S APPROVAL.
2. SOIL TRACKING PLAN TO APPLY TO WORK ACCESSED BY PROPOSED NORTHERN AND EASTERN ENTRANCES ONLY.
3. CONTRACTOR SHALL REMOVE ANY SOIL TRACKED ONTO EXISTING ONSITE OR PUBLIC ROADS DAILY.

GOVERNING STANDARDS AND SPECIFICATIONS:
FDEP "EROSION AND SEDIMENT CONTROL MANUAL", LATEST EDITION.

GENERAL NOTES:

1. A SOIL TRACKING PREVENTION DEVICE (STPD) SHALL BE CONSTRUCTED AT LOCATIONS DESIGNATED BY THE ENGINEER FOR POINTS OF EGRESS FROM UNSTABILIZED AREAS OF THE PROJECT TO PUBLIC ROADS WHERE OFF-SITE TRACKING OF MUD COULD OCCUR. TRAFFIC FROM UNSTABILIZED AREAS OF THE CONSTRUCTION PROJECT SHALL BE USED AS REQUIRED TO LIMIT AND DIRECT VEHICULAR EGRESS ACROSS THE STPD.
2. THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE TECHNIQUE TO MINIMIZE OFF-SITE TRACKING OF SEDIMENT. THE ALTERNATIVE MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO ITS USE.
3. ALL MATERIALS SPILLED, DROPPED, OR TRACKED ONTO PUBLIC ROADS (INCLUDING THE STPD AGGREGATE AND CONSTRUCTION MUD) SHALL BE REMOVED DAILY, OR MORE FREQUENTLY IF SO DIRECTED BY THE ENGINEER.
4. AGGREGATES SHALL BE AS DESCRIBED IN SECTION 901 EXCLUDING 901-2.3. AGGREGATES SHALL BE FDOT SIZE #1. IF THIS SIZE IS NOT AVAILABLE, THE NEXT AVAILABLE SMALLER SIZE AGGREGATE MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. SIZES CONTAINING EXCESSIVE SMALL AGGREGATE WILL TRACK OFF THE PROJECT AND ARE UNSUITABLE.
5. THE SEDIMENT PIT SHOULD PROVIDE A RETENTION VOLUME OF 3600 CUBIC FEET/ACRE OF SURFACE AREA DRAINING TO THE PIT. WHEN THE STPD IS ISOLATED FROM OTHER DRAINAGE AREAS, THE FOLLOWING PIT VOLUMES WILL SATISFY THIS REQUIREMENT:
15' x 50' = 100 FT.³ 30' x 50' = 200 FT.³
AS AN OPTION TO THE SEDIMENT PIT, THE WIDTH OF THE SWALE BOTTOM CAN BE INCREASED TO OBTAIN THE VOLUME. WHEN THE SEDIMENT PIT OR SWALE VOLUME HAS BEEN REDUCED TO ONE HALF, IT SHALL BE CLEANED. WHEN A SWALE IS USED, SYNTHETIC BALES OR SILT FENCE SHALL BE PLACED ALONG THE ENTIRE LENGTH.
6. THE SWALE DITCH DRAINING THE STPD SHALL HAVE A 0.02% MINIMUM AND A 1.0% MAXIMUM GRADE ALONG THE STPD AND TO THE SEDIMENT PIT.
7. MITERED END SECTIONS ARE NOT REQUIRED WHEN THE SIDEDRAIN PIPE SATISFIES THE CLEAR ZONE REQUIREMENTS.
8. THE STPD SHALL BE MAINTAINED IN CONDITION THAT WILL ALLOW IT TO PERFORM ITS FUNCTION. TO PREVENT OFF-SITE TRACKING, THE STPD SHALL BE RINSED (DAILY WHEN IN USE) TO MOVE ACCUMULATED MUD DOWNWARD THRU THE STONE. ADDITIONAL STABILIZATION OF THE VEHICULAR ROUTE LEADING TO THE STPD MAY BE REQUIRED TO LIMIT THE MUD TRACKED.
9. A STPD SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR SOIL TRACKING PREVENTION DEVICE, EA. THE UNIT PRICE SHALL CONSTITUTE FULL COMPENSATION FOR CONSTRUCTION, MAINTENANCE, REPLACEMENT OF MATERIALS, REMOVAL, AND RESTORATION OF THE AREA UTILIZED FOR THE STPD; INCLUDING BUT NOT LIMITED TO EXCAVATION, GRADING, TEMPORARY PIPE (INCLUDING MES WHEN REQUIRED), FILTER FABRIC, AGGREGATE, PAVED TURNOUT (INCLUDING ASPHALT AND BASE CONSTRUCTION), DITCH STABILIZATION, APPROACH ROUTE STABILIZATION, SEDIMENT REMOVAL AND DISPOSAL, WATER, RINSING AND CLEANING OF THE STPD AND CLEANING OF PUBLIC ROADS, GRASSING AND SOD. SYNTHETIC BALE OR BALE TYPE BARRIER SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR SYNTHETIC BALES, LF. SILT FENCE SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR STAKED SILT FENCE, LF.
10. THE NOMINAL SIZE OF A STANDARD STPD IS 15' x 50' UNLESS OTHERWISE SHOWN IN THE PLANS. IF THE VOLUME OF ENTERING AND EXITING VEHICLES WARRANT, A 30' WIDTH STPD MAY BE USED IF APPROVED BY THE ENGINEER. WHEN A DOUBLE WIDTH (30') STPD IS USED, THE PAY QUANTITY SHALL BE 2 FOR EACH LOCATION.

7.1.b

Mead & Hunt

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FL Cert. #26730

HOLLY HILL
FLORIDA

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CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT

FLOMICH STREET & RIVERSIDE DRIVE
HOLLY HILL, FL

ISSUED
02-19-2020 BID SET

NOT FOR CONSTRUCTION

MSH NO.: 1000710-191037.01
DATE: FEBRUARY 2020
DESIGNED BY: AMG
DRAWN BY: ADC
CHECKED BY: AEL
DO NOT SCALE DRAWINGS

SHEET CONTENTS
EROSION CONTROL
DETAILS

SHEET NO.

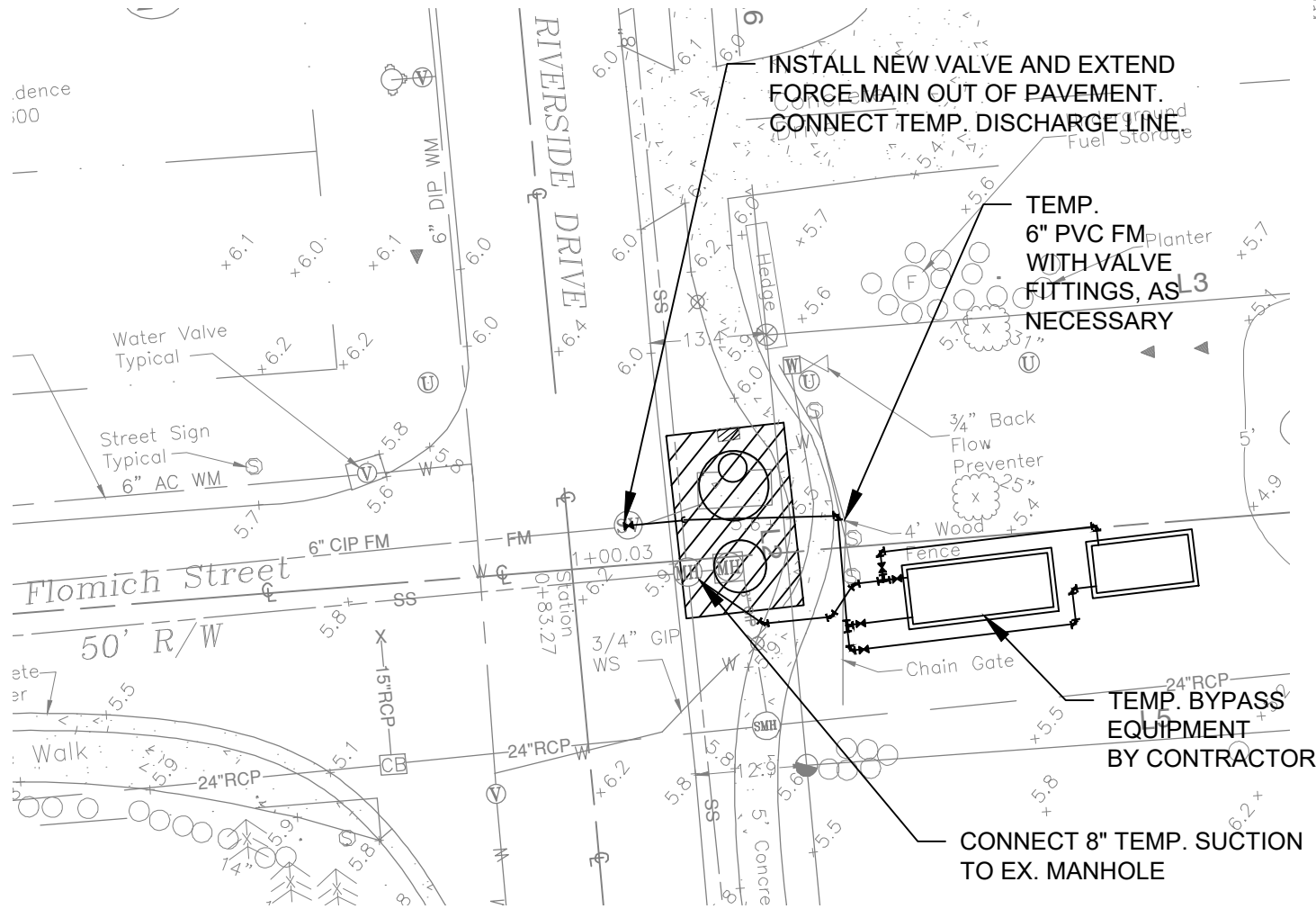
C-031

Packet Pg. 488

Attachment: HH Lift Station 9 Rehab BID SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

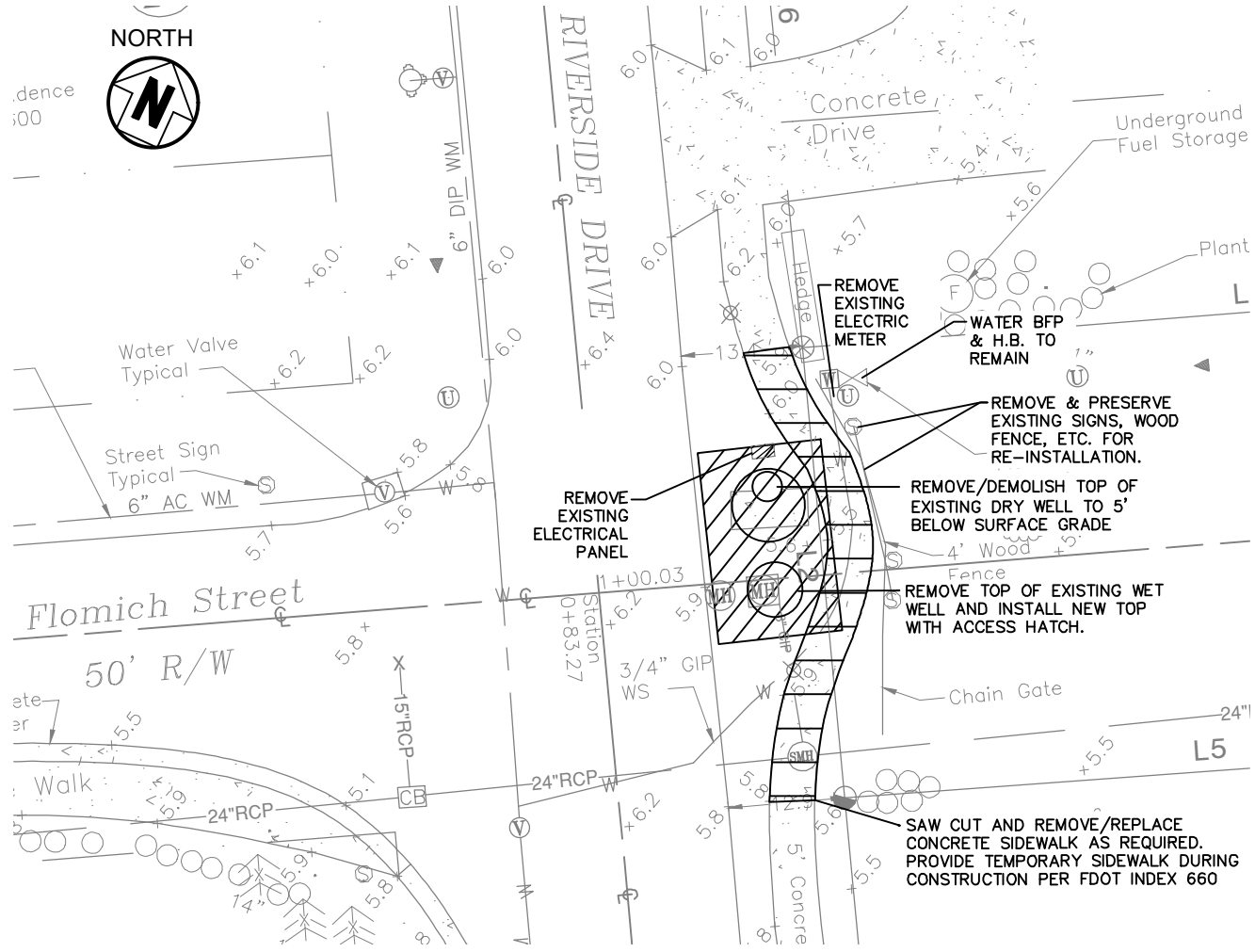
DEMOLITION NOTES:

1. REMOVE TOP SECTION OF WET WELL TO 3'-0" BELOW EXISTING GRADE OR CLOSEST PRECAST SECTION. SEE PROPOSED MECHANICAL FOR NEW WET WELL SECTION.
2. SEAL ALL WET WELL PENETRATIONS WITH NON-SHRINK H₂S RESISTANT GROUT (TYPICAL).
3. ALL EQUIPMENT REMOVED FROM EXISTING STATION TO BE TURNED OVER TO CITY, IF DESIRED. DISPOSAL BY CONTRACTOR IF NOT TURNED OVER TO CITY.
4. REMOVE ALL EXISTING PUMPS, PIPING, ELECTRICAL GEAR AND ALL OTHER EQUIPMENT FROM DRY PIT PUMP STATION. REMOVE TOP OF EXISTING STATION TO MIN. 5 FEET BELOW EXISTING GRADE. FILL REMAINING STATION WITH FLOWABLE FILL TO MIN. 5 FEET BELOW GRADE. FILL TO GRADE ABOVE STRUCTURE WITH CLEAN FILL & COMPACT TO 98% MAX. DENSITY PER AASHTO T-108. PROPOSED VALVE VAULT TO BE INSTALLED THIS LOCATION. SEE PROPOSED LIFT STATION SHEET C-201.
5. REMOVE EXISTING GROUT FILLETS FROM WET WELL.



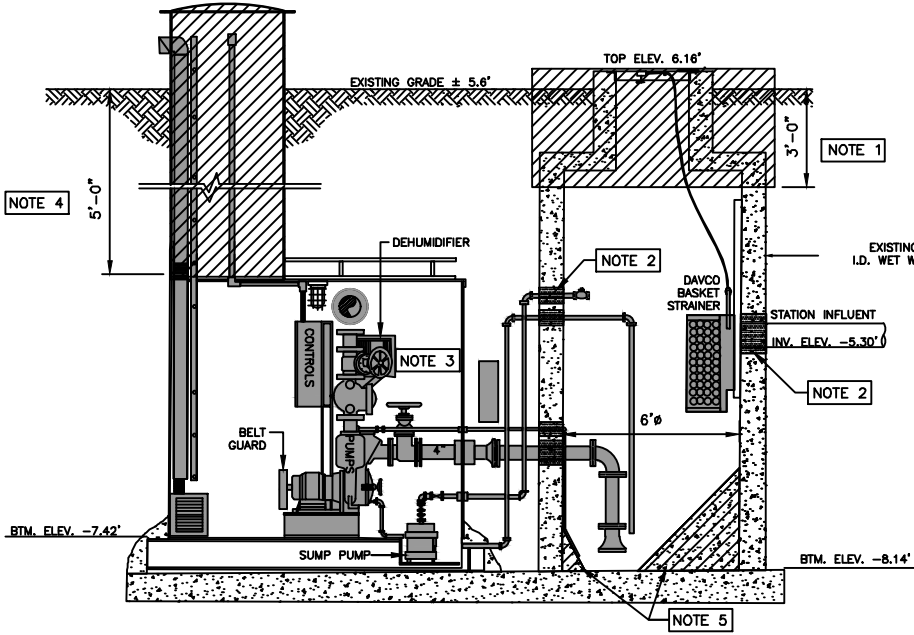
BYPASS PLAN

1" = 20'



LIFT STATION 9
DEMOLITION PLAN

1" = 20'



DEMOLITION SECTION VIEW

NOT TO SCALE

\\CORP-MEADHUNT.COM\SHARED\FOLDERS\ENTPR\1000710191037.01\TECH\CAD\DRAWINGS\C-141 PLAN.DWG
2/20/2020 4:58:38 PM

LIFT STATION WETWELL CONSTRUCTION NOTES:

1. WASTEWATER FLOW SHALL BE MAINTAINED AT ALL TIMES. BYPASS PUMPING SHALL BE REQUIRED.

2. ALL PIPING AND FITTINGS IN WET WELLS TO BE ASSEMBLED USING 316 STAINLESS STEEL BOLTS AND NUTS ONLY.

3. ELECTRICAL PERMIT TO BE OBTAINED FROM CITY OF HOLLY HILL, OR AUTHORITY HAVING JURISDICTION, PRIOR TO BEGINNING WORK ON ANY ELECTRICAL WIRING, EQUIPMENT, ETC. ALL ELECTRICAL WIRING TO COMPLY WITH NATIONAL ELECTRICAL CODE.

4. THREE COPIES OF THE LIFT STATION OPERATING MANUAL TO BE PROVIDED TO THE PUBLIC UTILITIES DEPARTMENT PRIOR TO FINAL ACCEPTANCE OF THE LIFT STATION.

5. EMERGENCY "HIGH LEVEL" WET WELL FLASHING ALARM LIGHT AND AUDIBLE ALARM HORN REQUIRED.

6. LINKABLE FUSED ELECTRICAL DISCONNECT REQUIRED.

7. ALL PUMP STATION WIRING SHALL BE STANDARD COPPER AND CONDUIT TO HAVE APPROPRIATE SEAL-OFFS.

8. THREE PHASE POWER AND MOTORS REQUIRED.

9. 4" SCH40 PVC CONDUIT FOR FLOAT WIRES SHALL BE INSTALLED FOR ALL OFFSET LIFT STATIONS.

10. LIFT STATION START-UP INSPECTIONS SHALL BE SCHEDULED AND COORDINATED THROUGH THE CITY'S SITE INSPECTOR (48 HOURS IN ADVANCE). UPON DETERMINING THAT ALL WORK IS COMPLETE AND READY THE CITY INSPECTOR SHALL THEN NOTIFY THE CITY, CONTRACTOR, ENGINEER OF RECORD, POWER COMPANY, AND THE PUMP SUPPLIER OF THE OFFICIAL START-UP INSPECTION DATE AND TIME. UPON COMPLETION THE ENGINEER OF RECORD SHALL PROVIDE TO THE CITY A SUMMARY OF THE RESULTS OF THAT TEST AND A LIST OF ALL PUNCH LIST ITEMS OUTSTANDING

11. PUMP STATION FINAL INSPECTION AND ACCEPTANCE PROCEDURES:

• WET WELL TO BE CLEAN AND DRY PRIOR TO ALL INSPECTIONS BY CITY PERSONNEL

• BEFORE FINAL APPROVAL OR ACCEPTANCE OF ANY PUMP STATION BY THE CITY, THERE SHALL BE FIELD INSPECTIONS MADE BY THE CITY'S REPRESENTATIVE AND INSPECTOR. THE FIELD INSPECTIONS SHALL SHOW THAT THE PUMP STATION IS FULLY OPERATIONAL AND ALL NECESSARY APPURTENANCES HAVE BEEN INSTALLED AND CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND THE STANDARD CONSTRUCTION DETAILS AS APPROVED BY THE PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.

• UPON COMPLETION AND BEFORE ACCEPTANCE OF THE PUMP STATION INSTALLATION, THE CONTRACTOR SHALL TEST ALL THE PUMPING EQUIPMENT TO DEMONSTRATE SATISFACTORY PERFORMANCE. IF DEFICIENCIES OCCUR, THE CONTRACTOR SHALL CORRECT THEM ACCORDINGLY AND EQUIPMENT SHALL BE RETESTED.

• REPRESENTATIVES FROM THE PUMPING EQUIPMENT MANUFACTURER, ENGINEER, CONTRACTOR, CITY AND THE ELECTRICAL CONTRACTOR SHALL BE PRESENT AT THE PUMP STATION START-UP TESTING AND FOR THE FINAL SITE INSPECTION.

• ALL PUMP STATION EQUIPMENT SHALL BE TESTED AT THE START-UP. THE MANUFACTURER / CONTRACTOR SHALL PROVIDE A FORMAL TEST PROCEDURE AND FORMS FOR RECORDING DATA. THE TESTS SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF A CITY REPRESENTATIVE AND CITY INSPECTOR. THE RECORDED FIELD DATA SHALL BE SUBMITTED TO THE PUBLIC UTILITIES DEPARTMENT ALONG WITH THE PUMP STATION ASBUILT AND PUMP STATION MAINTENANCE AND OPERATING MANUALS.

• ALL GROUND SURROUNDING THE PUMP STATION MUST BE GRADED AND SODDED. FINAL ACCEPTANCE OF THE PUMP STATION WILL NOT BE GIVEN UNTIL EFFECTIVE EROSION AND POSITIVE DRAINAGE CONTROL HAVE BEEN PROVIDED.

• PUMP STATIONS SHALL ONLY BE CONSIDERED AS ACCEPTABLE FOR OPERATION BY THE CITY UPON WRITTEN CONFIRMATION BY THE PUBLIC UTILITIES DEPARTMENT.

• IN THE EVENT THAT THE STATION OR ANY OF IT'S ASSOCIATED COMPONENTS ARE DETERMINED TO BE DEFICIENT AT THE START UP, THEN THE CITY RESERVES THE RIGHT TO REQUIRE A COMPLETE NEW START UP WITH ALL PARTIES PRESENT AS NOTED.
- GENERAL CONSTRUCTION NOTES
1. ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH ALL GOVERNING STANDARDS, SPECIFICATIONS, REGULATIONS AND PERTINENT DOCUMENTS.

2. UTILITIES & STRUCTURES AS SHOWN ON PLANS HAVE BEEN LOCATED FROM AVAILABLE RECORDS, BUT IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE LOCATION OF ALL UTILITIES AND STRUCTURES TO BE ENCOUNTERED IN THE WORK AND TO AVOID CONFLICT WITH EXISTING FACILITIES.

3. THE OWNER SHALL NOT BE HELD RESPONSIBLE FOR INACCURACIES OR OMISSIONS IN THE LOCATION, ELEVATION AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER EXISTING FEATURES.

4. THE CONTRACTOR SHALL CONTACT THE ENGINEER'S OFFICE IMMEDIATELY ON ANY CONFLICTS ARISING DURING CONSTRUCTION OF ANY IMPROVEMENTS SHOWN ON THESE DRAWINGS.

5. THE CONTRACTOR SHALL PROVIDE FORTY-EIGHT (48) HOURS NOTICE TO THE VARIOUS UTILITY OWNERS PRIOR TO CONSTRUCTION.

6. THE CONTRACTOR SHALL CONDUCT HIS WORK AS TO INSURE LEAST POSSIBLE OBSTRUCTION TO TRAFFIC AND INCONVENIENCE TO THE GENERAL PUBLIC AND THE RESIDENTS IN THE VICINITY OF THE WORK AND TO INSURE THE PROTECTION OF PERSONS AND PROPERTY. NO ROAD TO BE CLOSED TO THE PUBLIC EXCEPT WITH THE APPROVAL OF THE ENGINEER AND THE PROPER GOVERNMENTAL AUTHORITY.

7. THE CONTRACTOR SHALL EMPLOY A LAND SURVEYOR, REGISTERED IN THE STATE OF FLORIDA, TO REFERENCE AND RESTORE PROPERTY CORNERS AND LAND MARKERS WHICH MAY BE DISTURBED BY CONSTRUCTION AND TO ASSURE ACCURATE HORIZONTAL AND VERTICAL CONTROLS DURING CONSTRUCTION.

8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND THE CONTRACTOR'S EXPENSE TO PROVIDE THE CONSULTING ENGINEER WITH "AS-BUILT" DRAWINGS OF CONSTRUCTION. DRAWINGS SHALL CONTAIN SPECIFIC LOCATION OF ALL WATER MAINS, FORCE MAINS AND RECLAIMED WATER MAINS, VALVES AND SERVICE.

9. ADEQUATE EXCAVATION, SHEATING, SHORING AND BRACING SHALL BE PROVIDED AND SHALL CONFORM TO CONSTRUCTION REQUIREMENTS AS SET FORTH BY THE FEDERAL DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

10. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE A REVIEW OF THE SITE TO DETERMINE EXISTING CONDITIONS AND ANYTHING NOT SHOWN ON THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND SHALL NOT CONSTITUTE AN EXTRA UNLESS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS AND OTHER FEATURES AFFECTING HIS WORK PRIOR TO CONSTRUCTION.
- SITE PLAN NOTES:
1. REGRADE AND SOD ALL DISTURBED AREAS WITH TO MATCH EXISTING.

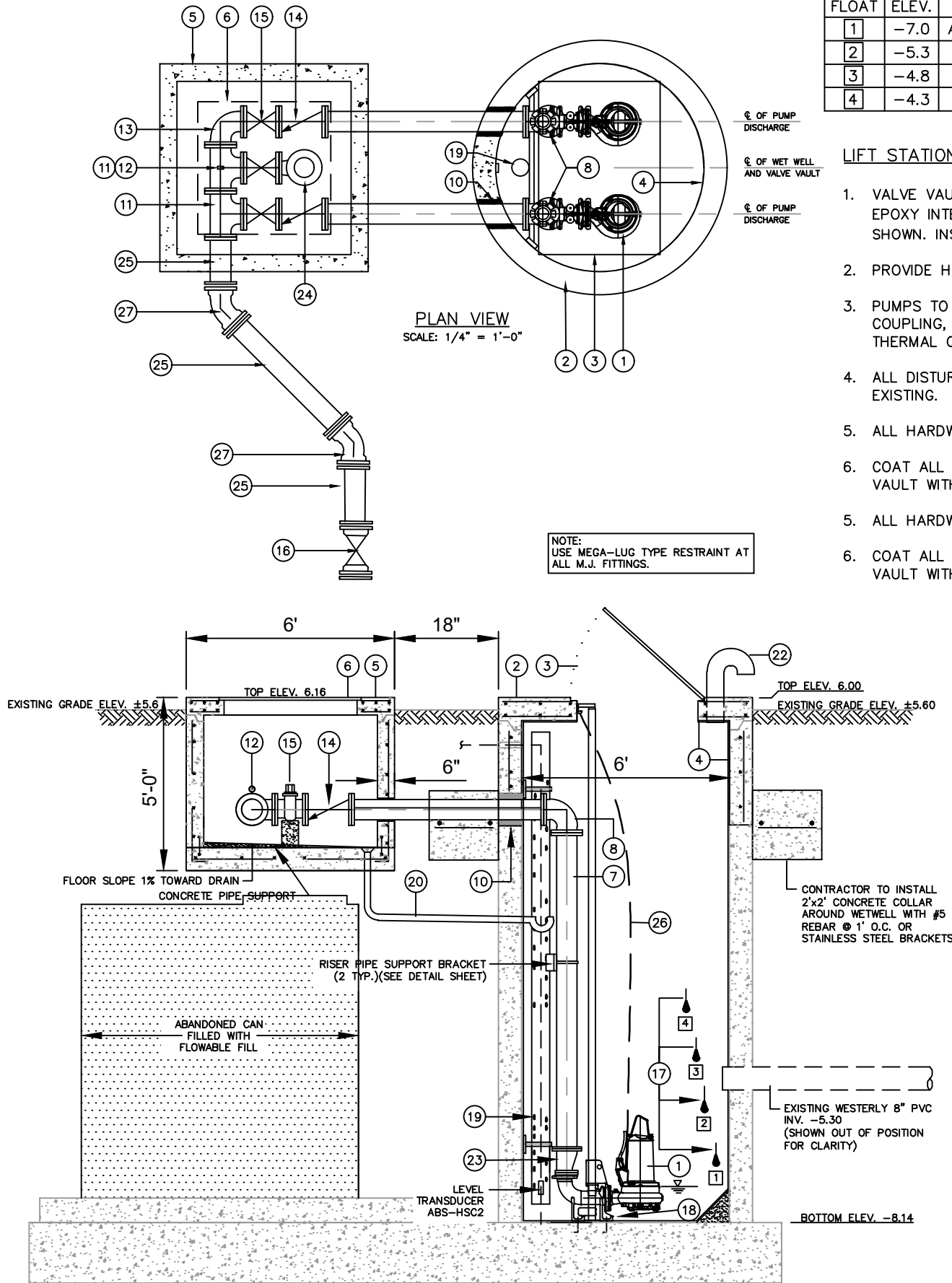
2. OTHER UNDERGROUND UTILITIES MAY EXIST. CONTRACTOR TO ADJUST WORK ACCORDINGLY.

3. FORCEMAIN TIE-IN TO BE PERFORMED DURING LOW FLOW PERIOD (NIGHT) AND SCHEDULED WITH CITY 72 HRS IN ADVANCE.
- RESTORATION NOTES
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO AND REPLACEMENT OF EXISTING UTILITIES. REPLACEMENT SHALL BE TO THE COMPLETE SATISFACTION OF THE ENGINEER.

2. THE CONTRACTOR SHALL PRESERVE FROM DAMAGE ALL PROPERTY ALONG THE LINE OF WORK, OR IN THE VICINITY THEREOF, OR IS IN ANY WAY AFFECTED BY THE WORK THE REMOVAL OF OR DESTRUCTION OF, WHICH IS NOT CALLED FOR BY THE PLANS. WHEREVER SUCH PROPERTY IS DAMAGED DUE TO CONSTRUCTION ACTIVITIES OF THE CONTRACTOR, IT SHALL BE IMMEDIATELY RESTORED TO ITS ORIGINAL CONDITION BY THE CONTRACTOR.

3. ALL RESTORATION SHALL CONFORM TO THE CITY OF HOLLY HILL REQUIREMENTS AT NO COST TO THE OWNER.
- The drawing is a detailed site plan for a lift station. It shows a central circular wetwell with two pumps. Surrounding the wetwell are various structures and utilities. A 24" RCP pipe runs horizontally across the middle. A 5' concrete walkway is shown on the right. A driveway is on the left. The plan includes numerous elevation points (e.g., +5.7, +5.6, +5.5, +5.8, +6.0, +6.2, +6.4, +6.6, +6.8, +7.0, +7.2, +7.4, +7.6, +7.8, +8.0, +8.2, +8.4, +8.6, +8.8, +9.0, +9.2, +9.4, +9.6, +9.8, +10.0, +10.2, +10.4, +10.6, +10.8, +11.0, +11.2, +11.4, +11.6, +11.8, +12.0, +12.2, +12.4, +12.6, +12.8, +13.0, +13.2, +13.4, +13.6, +13.8, +14.0, +14.2, +14.4, +14.6, +14.8, +15.0, +15.2, +15.4, +15.6, +15.8, +16.0, +16.2, +16.4, +16.6, +16.8, +17.0, +17.2, +17.4, +17.6, +17.8, +18.0, +18.2, +18.4, +18.6, +18.8, +19.0, +19.2, +19.4, +19.6, +19.8, +20.0, +20.2, +20.4, +20.6, +20.8, +21.0, +21.2, +21.4, +21.6, +21.8, +22.0, +22.2, +22.4, +22.6, +22.8, +23.0, +23.2, +23.4, +23.6, +23.8, +24.0, +24.2, +24.4, +24.6, +24.8, +25.0, +25.2, +25.4, +25.6, +25.8, +26.0, +26.2, +26.4, +26.6, +26.8, +27.0, +27.2, +27.4, +27.6, +27.8, +28.0, +28.2, +28.4, +28.6, +28.8, +29.0, +29.2, +29.4, +29.6, +29.8, +30.0, +30.2, +30.4, +30.6, +30.8, +31.0, +31.2, +31.4, +31.6, +31.8, +32.0, +32.2, +32.4, +32.6, +32.8, 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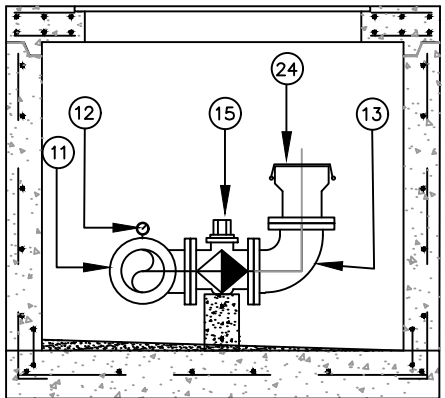
NOTE:
USE MEGA-LUG TYPE RESTRAINT AT
ALL M.J. FITTINGS.

BACKUP FLOAT SETTINGS			
FLOAT	ELEV.	ACTION	NOTES
1	-7.0	ALL PUMPS OFF	ADJUST PER OWNER / MANUFACTURER
2	-5.3	PUMP #1 ON	ADJUST PER OWNER / MANUFACTURER
3	-4.8	PUMP #2 ON	ADJUST PER OWNER / MANUFACTURER
4	-4.3	HIGH LEVEL	ADJUST PER OWNER

LIFT STATION NOTES:

1. VALVE VAULT TO HAVE (2) COATS - 15 MILS TOTAL OF COAL TAR EPOXY INTERIOR COATING. INSTALL 2" SCH80 PVC VAULT DRAIN AS SHOWN. INSTALL 2" DRAIN TRAP INSIDE WETWELL.
2. PROVIDE HASP TYPE LOCKING MECHANISM ON ALL ACCESS HATCHES
3. PUMPS TO BE FURNISHED WITH HIGH PRESSURE DISCHARGE COUPLING, STAINLESS STEEL SLIDERAIL SYSTEM, SEAL FAILURE AND THERMAL OVERLOAD INDICATORS.
4. ALL DISTURBED AREAS TO BE REGRADED AND SODDED TO MATCH EXISTING.
5. ALL HARDWARE INSIDE WETWELL TO BE 316 STAINLESS STEEL.
6. COAT ALL DIP PIPING, VALVES, FITTINGS IN WET WELL AND VALVE VAULT WITH 15 MILS OF COAL TAR EPOXY.
5. ALL HARDWARE INSIDE WETWELL TO BE 316 STAINLESS STEEL.
6. COAT ALL DIP PIPING, VALVES, FITTINGS IN WET WELL AND VALVE VAULT WITH 15 MILS OF COAL TAR EPOXY.

PROPOSED LIFT STATION OPERATION DATA	
EST. DAILY FLOW = 60,000-100,000 GPD (EXISTING)	
NO NEW FLOWS ARE PROPOSED	
EST. AVG. RUN TIME = 5-6 HOURS PER DAY	

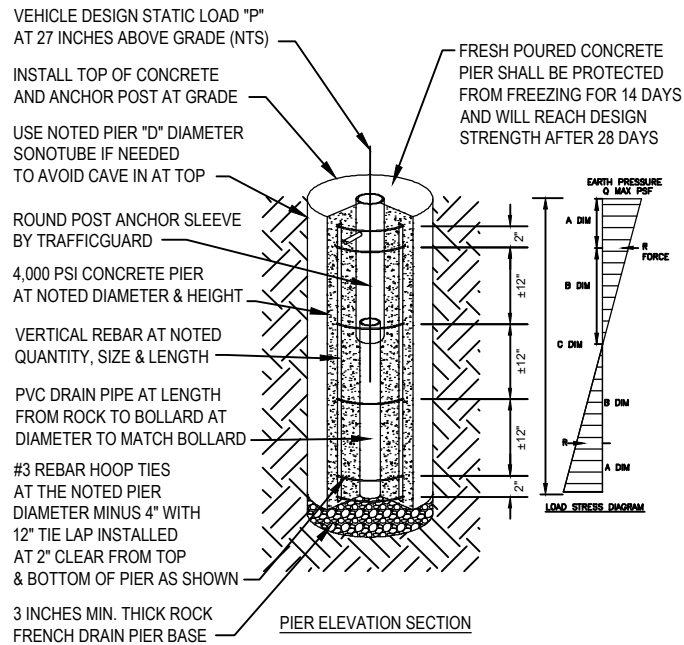
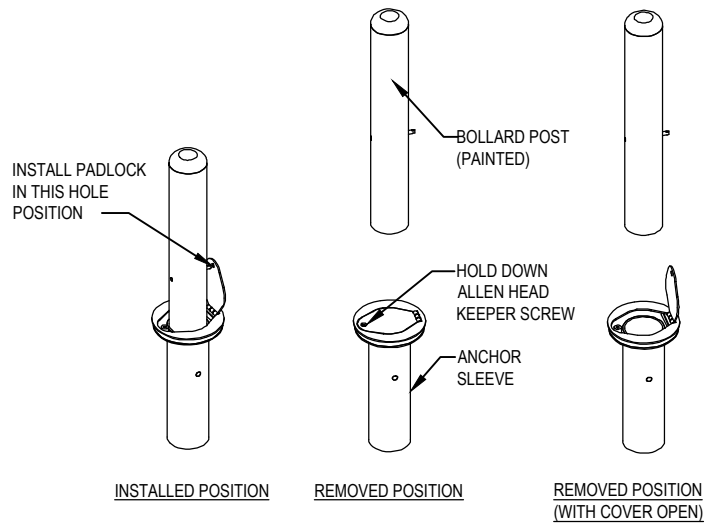


EMERGENCY PUMP CONNECTION DETAIL
NTS

EQUIPMENT KEY LIST

1. PROPOSED SUBMERSIBLE PUMPS
(2) ABS MODEL # XFP100C CB1 WITH 4" DISCHARGE, 180 GPM @ 32' FT TDH 5 HP, 1746 RPM, 3Ø, 60Hz, 240V. PUMP ASSEMBLIES TO INCLUDE (2) 2" 316SS GUIDE BARS AND FLOAT HANGERS. ALL ATTACHMENT HARDWARE TO BE 316SS. HOISTING CHAIN TO BE 316 SS.
2. EXISTING 6 FT. I.D. CONCRETE WET WELL. FURNISH AND INSTALL NEW 6" DIA. TOP. FURNISH AND INSTALL NEW PRECAST CONCRETE WET WELL TOP WITH ALUMINUM ACCESS HATCHES (SEE 3 BELOW). KEY TOP SLAB TO NEW WET WELL SECTION. CONTRACTOR TO VERIFY DIAMETER BEFORE ORDERING TOP.
3. BILCO OR HALLIDAY PRODUCTS WET WELL SPRING ASSISTED ACCESS HATCH WITH H-20 LOADING. COORDINATE ACCESS HATCH LOCATION WITH PUMP MOUNTING LOCATIONS. MINIMUM CLEAR OPENING 42"x60" TO PROVIDE CLEARANCE ON ALL SIDES OF PUMP FOR REMOVAL. ALL HARDWARE TO BE 316SS.
4. FURNISH AND INSTALL "RAVEN" OR "SPECTRASHIELD" EPOXY INTERIOR LINER IN NEW WET WELL. TO BE INSTALLED AFTER ALL PIPE AND HARDWARE AND PRIOR TO BASEPLATE INSTALLATION (SEE PROJECT SPECIFICATIONS).
5. PRECAST VALVE VAULT. 5'x5' MINIMUM INTERIOR DIMENSION. FIELD INSTALL CONCRETE PIPE SUPPORTS.
6. BILCO OR HALLIDAY PRODUCTS VALVE VAULT SPRING ASSISTED ACCESS HATCH WITH H-20 LOADING. 42"x42" MIN. CONTRACTOR TO VERIFY HATCH SIZE IS ADEQUATE. TO PROVIDE UNOBSTRUCTED ACCESS TO ALL VALVES. (SEE NOTE 2)
7. DISCHARGE RISER 6" HDPE DR9 PIPE WITH WELDED FLANGES AND 316SS HARDWARE (TYP. OF 2).
8. 6" FL HDPE 90° BEND (TYP. OF 2)
9. GROUT SEAL AROUND DISCHARGE LINES WITH H₂S RESISTANT NON-SHRINK GROUT PRIOR TO LINER INSTALLATION (TYP.)
10. GROUT SEAL AROUND DISCHARGE LINES WITH H₂S RESISTANT NON-SHRINK GROUT PRIOR TO LINER INSTALLATION (TYP.)
11. 6" FLANGED TEE. DIP EPOXY LINED (TYP. OF 2)
12. 0-40 PSI GLYCERIN FILLED PRESSURE GAUGE IN TAPPED FLANGED CROSS BOSS WITH BRASS GATE VALVE
13. 6" FL. 90° BEND. DIP EPOXY LINED.
14. 6" FL. CUSHIONED CHECK VALVE W/ SWING ARM. (TYP. OF 2)
15. 6" AMERICAN BALL VALVE (TYP. OF 3)
16. REMOVE AND REPLACE EXISTING 6" GATE VALVE, EPOXY LINED WITH VALVE BOX. CONCRETE PAD AROUND VALVE BOX SHALL BE 12"x12"x6" (TYP. OF 1).
17. 4 FLOATS FOR PUMP CONTROL. SEE FLOAT SETTINGS CHART THIS SHEET.
18. ANCHOR BASE ELBOW TO WET WELL FLOOR. INSTALL 1/2" 316SS PLATE WITH 3/4" STAINLESS STEEL ALL THREAD TO ANCHOR BASE ELBOWS TO ONE (1) BASE PLATE. BASE PLATE TO BE ANCHORED TO WETWELL WITH MIN. FOUR (4) 3/4" ALL THREAD WITH EPOXY ANCHORS (MIN. 4" EMBEDDED) IN CONCRETE FLOOR.
19. LEVEL TRANSDUCER STILLING WELL 6" PVC WITH 1/2" HOLES AS SHOWN. SUPPORT BRACKETS 316SS.
20. 2" SCH80 PVC VALVE VAULT DRAIN WITH TRAP
21. 6" MJ 90° BEND, DIP EPOXY LINED (TYP. OF 3)
22. 6" SCH80 PVC WET WELL VENT WITH 316SS INSECT SCREEN. 6" PIPE SLEEVE TO BE CAST INTO WETWELL TOP. PIPE AND FITTINGS DRY-FIT, NOT GLUED.
23. 4"x6" FL. ECCENTRIC REDUCER, DIP EPOXY LINED.
24. 6" CAMLOCK EMERGENCY PUMP CONNECTION WITH DUST CAP PER CITY STANDARDS.
25. 6" DIP EPOXY LINED FM, FIELD MEASURE.
26. 316 SS HOIST CHAIN
27. 6" 45° BEND, MJ, DIP EPOXY LINED.

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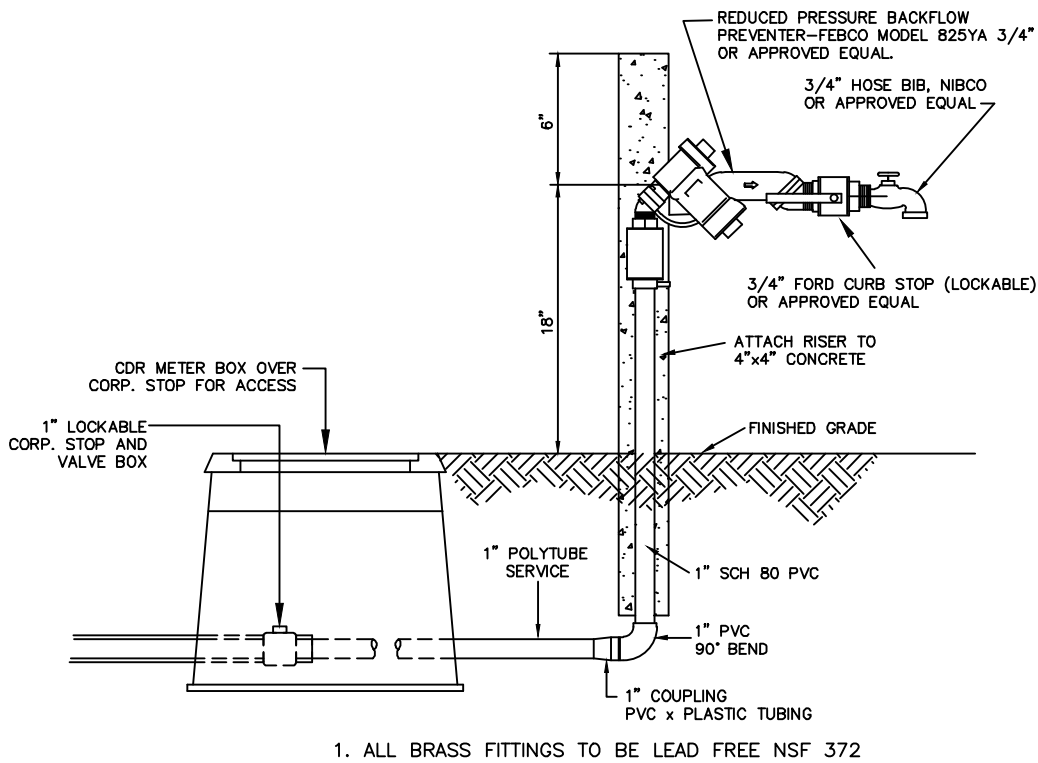
- NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.
 3. DO NOT SCALE DRAWING.
 4. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info REFERENCE NUMBER 4209-014.

ROUND POST LOCK

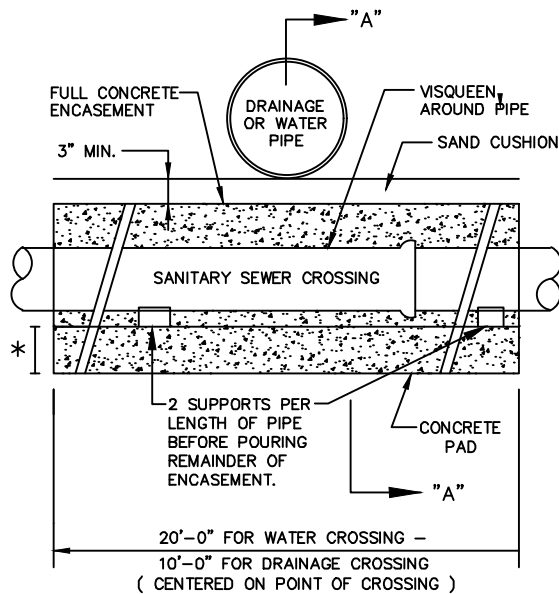
MODEL RPL4 - TRAFFICGUARD® ROUND POST LOCK (36" POST HEIGHT, 4.5" OD), ASSEMBLY DETAIL

BOLLARD DETAIL

NOT TO SCALE



LIFT STATION WATER SERVICE
NOT TO SCALE

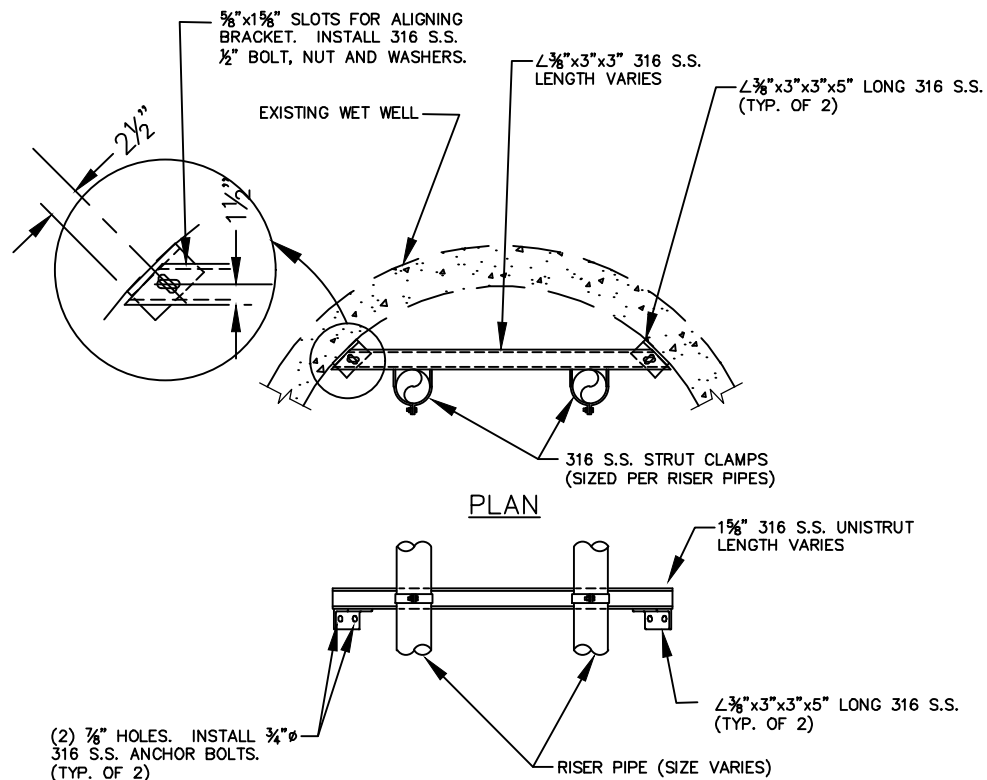


ELEVATION

NOTES:

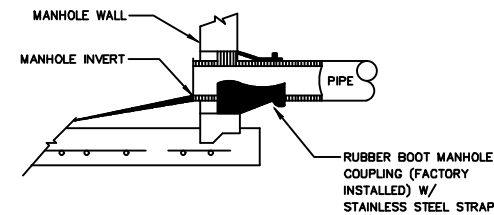
1. ALL CONCRETE SHALL BE 3000 PSI MINIMUM 28 DAYS STRENGTH.
2. WATER MAIN SHALL BE LOCATED ABOVE OR BELOW ENCASEMENT AS SHOWN ON PLANS OR DETERMINED IN THE FIELD, USE ENCASEMENT WHERE VERTICAL CLEARANCE WATER MAIN AND SEWER MAIN IS LESS THAN 18 INCHES.
3. NO DUCTILE IRON SEWER PIPE IS PERMITTED.

SEWER / WATER / DRAINAGE CROSSING
NOT TO SCALE

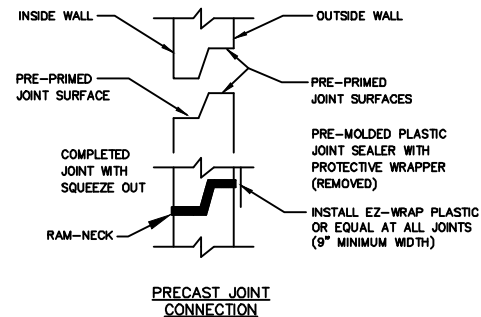


ELEVATION

RISER PIPE SUPPORT BRACKET DETAIL
NOT TO SCALE



MANHOLE PIPE CONNECTION DETAIL
FOR NEW CONNECTIONS IN EXISTING MANHOLES



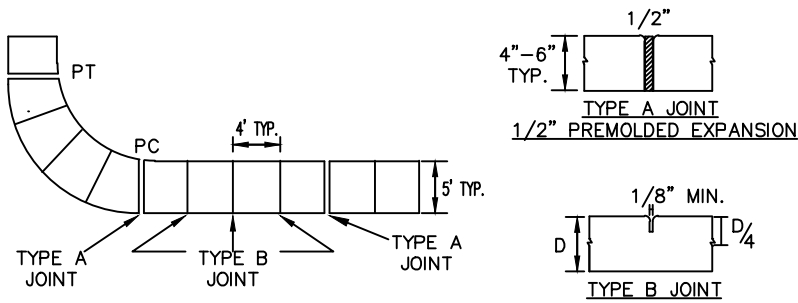
PRECAST JOINT CONNECTION

RUBBER BOOT AND PRECAST JOINT CONNECTION DETAILS
NOT TO SCALE

NOTES:

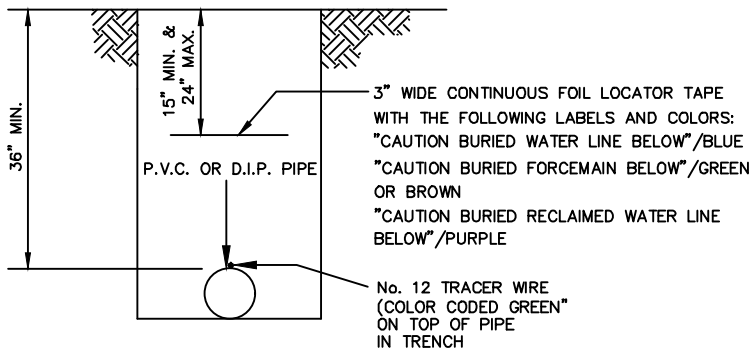
1. ALL NEW CONNECTIONS TO EXISTING SANITARY SEWER MANHOLES SHALL UTILIZE A CORING METHOD AND THE IN-FIELD INSTALLATION OF A RUBBER BOOT INTO THE MANHOLE.

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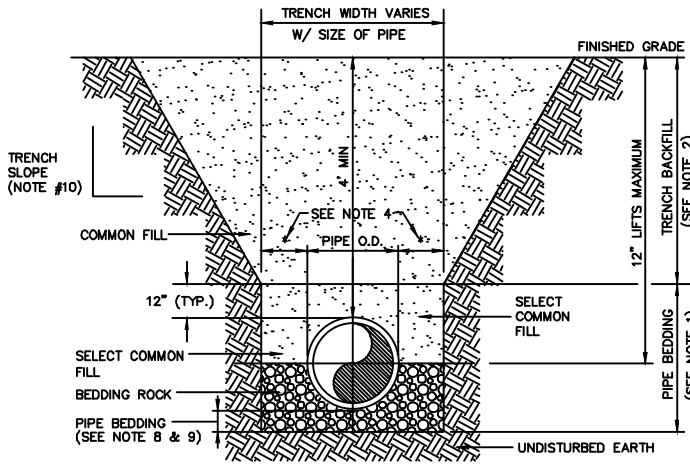
1. SIDEWALKS, BIKEPATHS, RAMPS, AND DRIVEWAY APRONS SHALL BE CONSTRUCTED OF PLAIN PORTLAND CEMENT CONCRETE WITH A MAXIMUM SLUMP OF 3 INCHES, A MINIMUM DEVELOPED COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS, AND A MINIMUM UNIFORM THICKNESS OF 4 INCHES WHERE INTENDED SOLELY FOR PEDESTRIAN TRAFFIC, AND 6 INCHES THICK WHERE MOTOR VEHICLES ARE LIKELY TO CROSS.
2. SIDEWALKS AND BIKEPATHS SHALL BE PLACED PARALLEL TO, AND ONE FOOT WITHIN THE RIGHT-OF-WAY LINE EXCEPT THAT THE CITY MAY APPROVE DEVIATIONS TO SAVE SPECIMEN TREES PROVIDED THAT THE SIDEWALK REMAINS WITHIN THE RIGHT-OF-WAY OR AN APPROVED SIDEWALK EASEMENT ABUTTING THE RIGHT OF WAY. SIDEWALKS AND BIKE PATHS SHOULD BE LOCATED AT LEAST 4 FEET FROM THE EDGE OF THE STREET PAVEMENT UNLESS OTHERWISE APPROVED BY THE CITY.
3. THE TOP OF THE CONCRETE SHALL BE AT AN ELEVATION NO LOWER THAN THE CROWN OF THE ADJACENT ROADWAY, AND NO HIGHER THAN 8 INCHES ABOVE THE CROWN UNLESS APPROVED BY THE CITY TO MAKE A MORE NATURAL TRANSITION WITH THE ADJACENT LAND.
4. ALL WALKS SHALL HAVE A CROSS SLOPE OF 1/4" INCH PER FOOT AND SHALL NOT EXCEED A LONGITUDINAL SLOPE OF 1:20, EXCEPT AT DESIGNATED RAMPS THAT SHALL NOT EXCEED 1:12. PROVIDE A DETECTABLE WARNING SURFACE AT ALL RAMPS PER A.D.A. THE CONTRACTOR SHALL INSURE THAT ALL PROVISIONS OF A.D.A. AND FLORIDA ACCESSIBILITY CODE ARE MET.*
5. ISOLATION JOINTS (TYPE A JOINTS) SHALL BE PROVIDED BETWEEN EXISTING SLABS OR STRUCTURES AND FRESH CONCRETE, TO SEPARATE PEDESTRIAN SECTIONS FROM SECTIONS WHICH WILL ENCOUNTER VEHICLE TRAFFIC, TO SEPARATE FRESH PLACEMENT FROM CONCRETE WHICH HAS SET FOR MORE THAN 60 MINUTES, AND NO FARTHER APART THAN 100 FEET IN SIDEWALKS AND BIKEPATHS. JOINT MATERIAL SHALL BE AS SPECIFIED IN F.D.O.T. STANDARDS AND SPECIFICATIONS AND SHALL BE RUBBER, PLASTIC OR OTHER APPROVED NON-BIODEGRADABLE ELASTOMERIC MATERIAL. WOOD AND DECCA-DRAIN STYLE POOL DRAINS ARE STRICTLY PROHIBITED.
6. CONTROL JOINTS (TYPE B JOINTS) SHALL BE TOOLED INTO THE FRESH CONCRETE TO A DEPTH EQUAL TO 1/4 THE SLAB THICKNESS AND SPACED APART A DISTANCE EQUAL TO THE WIDTH OF THE SLAB OR 5 FEET WHICHEVER IS GREATEST.
7. THE SLAB SURFACE SHALL BE BROOM FINISHED TO BE SLIP RESISTANT, AND SHALL MATCH AS CLOSELY AS POSSIBLE THE FINISH OF EXISTING ADJACENT SLABS AND ALL EDGES SHALL BE TOOLED TO ELIMINATE SHARP CORNERS.
8. THE BEARING SUBSURFACE SHALL HAVE ALL ORGANIC, LOOSE, AND DELETERIOUS MATTER REMOVED, AND THE REMAINING CLEAN SOIL SHALL BE SMOOTH, SOUND, AND SOLID. ANY FILL MATERIAL SHALL BE COMPACTED WITH A VIBRATORY OR IMPACT COMPACTION MACHINE IN MAXIMUM 12 INCH LIFTS OR COMPACTED WITH A HAND TAMPER IN MAXIMUM 4 INCH LIFTS THE CITY SHALL REQUIRE A COMPACTION TEST FOR EACH LIFT IF THE TOTAL FILLED SECTION IS MORE THAN 12 INCHES DEEP OR IF THE SUBSURFACE HAS BEEN DISTURBED MORE THAN 12 INCHES DEEP. WHERE SUCH TEST IS REQUIRED, THE RESULTS SHALL SHOW A MINIMUM PROCTOR FIELD DENSITY OF 95 PERCENT.
9. ALL CONCRETE WORK IN THE RIGHT-OF-WAY SHALL BE INSPECTED BY THE CITY AFTER THE SUBSOIL IS PREPARED AND THE FORMS ARE SET, BUT BEFORE THE CONCRETE PLACEMENT BEGINS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE FINISHED SLAB FROM ALL DAMAGE AND VANDALISM UNTIL THE CITY ACCEPTS OR APPROVES THE SLAB. AFTER WHICH TIME THE OWNER OF THE ABUTTING LAND SHALL BE RESPONSIBLE FOR THE SLAB IN ACCORDANCE WITH THE CITY CODE. ANY SLAB SECTION DAMAGED OR VANDALIZED PRIOR TO ACCEPTANCE OR APPROVAL SHALL BE CUT OUT BETWEEN JOINTS AND REPLACED. REPAIRS ARE NOT ACCEPTABLE.
11. SIDEWALKS LOCATED WITHIN THE RIGHT-OF-WAY SHALL NOT BE TINTED, STAINED, COLORED, OR COATED.
12. ALL FORMS SHALL BE REMOVED PRIOR TO ACCEPTANCE OR APPROVAL AND THE DISTURBED GROUND SHALL BE BACKFILLED, REGRADED, AND SODDED SO THAT THE WEAR SURFACE OF THE CONCRETE IS REASONABLY FLUSH WITH THE ADJACENT GRADE.

SIDEWALK CONSTRUCTION REQUIREMENTS
NTS



NOTE:
"TERRA TAPE D" or SIMILAR
No. 12 TRACER WIRE TO BE INSTALLED WITH ALL NON-METALLIC PIPE. WIRE SHALL BE BROUGHT UP TO GRADE AT ALL VALVES INSIDE P.V.C. SLEEVE.

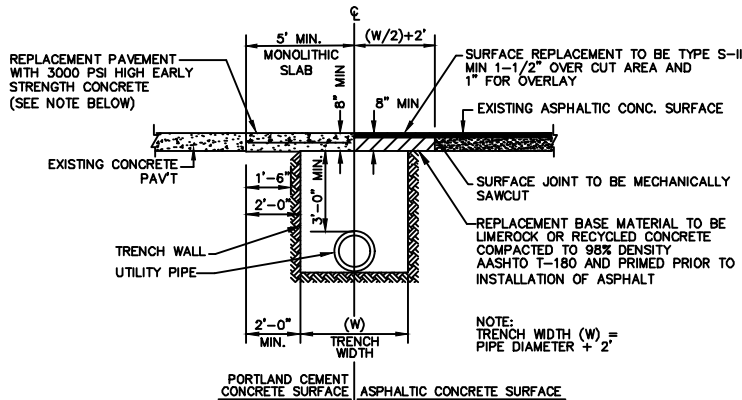
LOCATOR TAPE/ TRACERWIRE INSTALLATION FOR
SEWER, WATER AND RECLAIMED WATER PIPELINES
NOT TO SCALE



NOTES:

1. PIPE BEDDING: #57 STONE OR BEDDING ROCK COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180. (98% DENSITY REQUIRED UNDER PAVEMENT, DRIVEWAYS AND STRUCTURES.)
3. USE TYPE "A" BEDDING TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE CITY.
4. (*): 15" MAX. FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX. FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF FLOW.
7. REFER TO SECTION 32.5 OF THE MANUAL FOR SHEETING AND BRACING IN EXCAVATIONS.
8. GRAVITY SEWERS SHALL UTILIZE TYPE "A" BEDDING, WHERE UNSUITABLE MATERIAL EXISTS. BEDDING DEPTH SHALL BE 4" MINIMUM FOR PIPE DIAMETER LESS THAN 15", AND 6" MINIMUM FOR PIPE DIAMETER 16" AND LARGER.
9. DEPTH FOR REMOVAL OF UNSUITABLE MATERIAL SHALL GOVERN DEPTH OF BEDDING ROCK BELOW THE PIPE. CITY SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION.
10. REFER TO OSHA REQMTS. FOR SLOPING, SHEETING AND BRACING IN EXCAVATIONS.

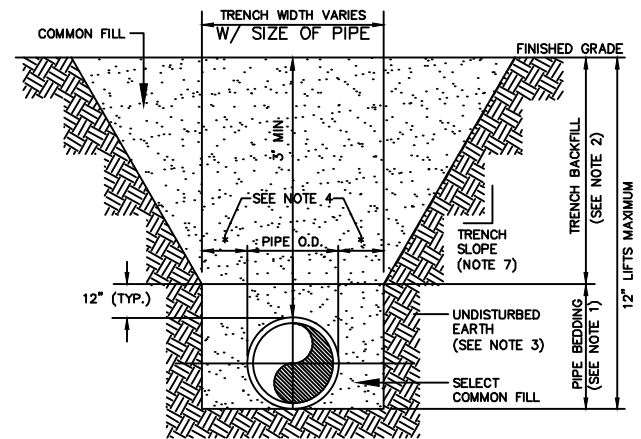
TYPE "A" BEDDING AND TRENCHING DETAIL
NOT TO SCALE



NOTES:

1. PAVING REPLACEMENT SHALL INCLUDE RAISING ALL MANHOLE FRAMES AND LIDS AND VALVE BOXES AND LIDS (AND SIMILAR APPURTENANCES) TO FINAL ELEVATION PRIOR TO RESURFACING
2. SUBBASE TO BE COMPACTED TO 98% MAXIMUM DENSITY AASHTO T-180
3. IN AREAS WHERE CONCRETE PAVEMENT IS TO BE UTILIZED, 3000 PSI - 28 DAY STRENGTH CONCRETE PAVEMENT MAY BE PERMITTED PROVIDED THAT THE SUBJECT AREA WILL REMAIN FREE OF VEHICULAR TRAFFIC FOR A MINIMUM OF 3 DAYS.

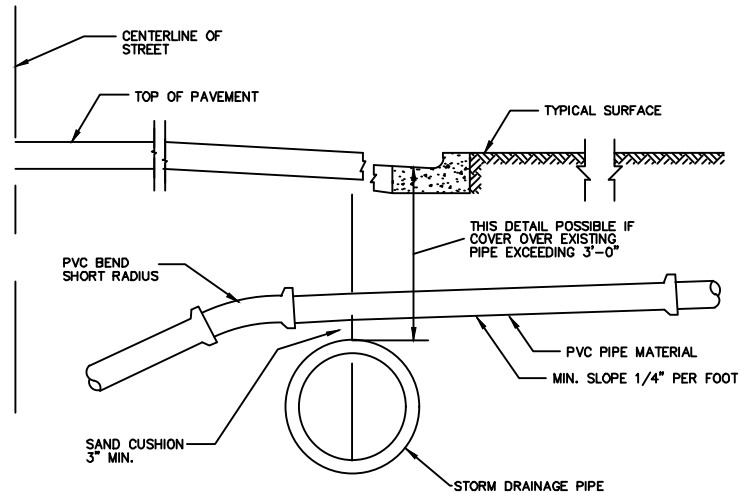
PAVEMENT TRENCH RESTORATION
NOT TO SCALE



NOTES:

1. PIPE BEDDING: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180, (98% DENSITY REQUIRED UNDER DRIVEWAYS, PAVEMENT AND STRUCTURES.)
3. PIPE BEDDING UTILIZING SELECT COMMON FILL OR BEDDING ROCK IN ACCORDANCE WITH TYPE "A" BEDDING AND TRENCHING DETAIL MAY BE REQUIRED AS DIRECTED BY THE CITY.
4. (*): 15" MAX. FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX. FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF FLOW.
7. REFER TO OSHA REQUIREMENTS FOR SLOPING, SHEETING AND BRACING IN EXCAVATIONS.
8. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.

TYPE "B" BEDDING AND TRENCHING DETAIL
NOT TO SCALE



ALTERNATE GRADIENT FOR HOUSE SERVICE
SEWERS AT CONFLICTS WITH EXISTING STORM
SEWERS & OTHER EXISTING CONDUITS

STORM DRAINAGE CROSSING/
SANITARY LATERAL PIPE CROSSING
NOT TO SCALE

**CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT**

FLOMIC STREET & RIVERSIDE DRIVE

ISSUED
02-19-2020
BID SET

NOT FOR CONSTRUCT

M&H NO.: 1000710-191037
DATE: FEBRUARY 2021
DESIGNED BY: AMG
DRAWN BY: ADC
CHECKED BY: AEL
DO NOT SCALE DRAWINGS

SHEET CONTENTS
MISCELLANEOUS
DETAILS

SHEET NO.

C-503

Packet Pg. 493

Attachment: HH Lift Station 9 Rehab BID SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

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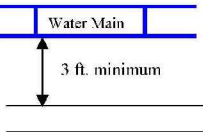
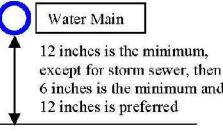
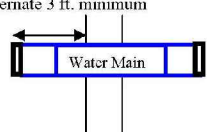
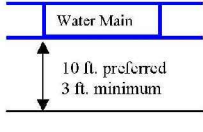
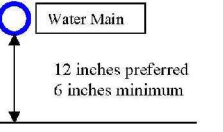
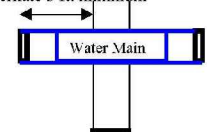
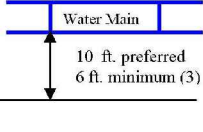
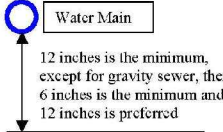
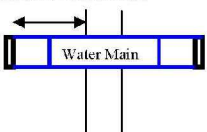
SANITARY SEWER CONSTRUCTION NOTES

1. THE CITY'S PUBLIC UTILITIES DEPARTMENT (248-9463) SHALL BE GIVEN A MINIMUM OF 48 HOURS ADVANCE NOTICE (NOT INCLUDING HOLIDAYS OR WEEKENDS) PRIOR TO BEGINNING ANY SANITARY SEWER CONSTRUCTION.
2. ALL GRAVITY SANITARY SEWER MAIN LINES SHALL BE 8" DIAMETER MINIMUM. COMMERCIAL SERVICE LATERALS WITH MULTIPLE CONNECTIONS SHALL BE GREEN 6" DIAMETER OR LARGER. ALL SINGLE FAMILY RESIDENTIAL SERVICE LATERALS SHALL BE 4" SINGLE SERVICES.
3. ALL GRAVITY SANITARY SEWER LINES SHALL BE GREEN PVC SDR 26, ASTM D-3034. IN PLACES WHERE A MINIMUM COVER OF 4.0' CANNOT BE MAINTAINED, AWWA C-900 OR C-905 GREEN PVC DR-25, CLASS 100 OR CONCRETE ENCASEMENT SHALL BE USED. WATER LINES, RECLAIMED LINES, AND STORM DRAINAGE CROSSINGS SHALL ALSO FOLLOW THE CONCRETE ENCASEMENT REQUIREMENT PER THESE STANDARDS AND AS PER REGULATORY REQUIREMENTS.
4. MINIMUM GRAVITY SANITARY SEWER SLOPES ARE AS FOLLOWS:
8" PIPE 0.40%
10" PIPE 0.30%
12" PIPE 0.22%
5. MAXIMUM DEPTH OF SANITARY MANHOLES SHALL BE 15.0'. MAXIMUM DEPTH OF WET WELLS SHALL BE 20.0'.
6. GRAVITY SANITARY SEWER LINES SHALL BE INSTALLED WHENEVER POSSIBLE UNDER PAVED AREAS WITHIN PUBLIC RIGHTS-OF-WAY. UTILITY EASEMENTS SHALL BE PROVIDED WHENEVER PUBLICLY-OWNED SEWER LINES ARE CONSTRUCTED OUTSIDE OF A PUBLIC RIGHT-OF-WAY.
7. GRAVITY SANITARY SEWER LINE CONSTRUCTION SHALL BE ACCOMPLISHED BY THE USE OF A LASER INSTRUMENT UNLESS ANOTHER METHOD IS PREVIOUSLY APPROVED BY THE CITY.
8. THE CONTRACTOR SHALL AT ALL TIMES, DURING PIPE LAYING OPERATIONS, DEWATER THE GROUND SUFFICIENTLY TO KEEP THE GROUNDWATER ELEVATION A MINIMUM OF 6" BELOW THE PIPE BEING LAID WITHIN THE AREA OF THE TRENCH.
9. ALL PIPES SHALL BE LAID ON A FIRM FOUNDATION. SOFT OR SPONGY BEDDING FOR PIPES IS NOT ACCEPTABLE. ANY UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH A DRY, COMPACTED, GRANULAR MATERIAL SATISFACTORY TO THE CITY.
10. ON ALL EXCAVATION AND BACKFILLING THE CONTRACTOR SHALL PROVIDE ADEQUATE SHEETING AND BRACING IN ORDER TO PROVIDE FOR THE SAFETY OF WORKMEN, AS WELL AS REPRESENTATIVES OF THE CITY, THE DESIGN ENGINEER, AND THE DEVELOPER.
11. ALL TRENCHES SHALL BE BACKFILLED WITH CLEAN FILL AND COMPACTED TO THE SPECIFIED MINIMUM COMPACTION (95% IN UNPAVED AREAS AND 98% IN PAVED AREAS) OF THE OPTIMUM DENSITY OF THAT MATERIAL BASED ON THE AASHTO T-180 MODIFIED PROCTOR TEST.
12. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE THAT COMPACTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. TESTS SHALL BE DONE ONE FOOT ABOVE THE PIPE AND THEN AT ONE FOOT VERTICAL INTERVALS UNTIL FINAL GRADE IS REACHED. TESTING SHALL BE COMPLETED AND TEST DOCUMENTS SUBMITTED TO THE CITY AT A MINIMUM FREQUENCY OF ONE SET OF TESTS BETWEEN EACH MANHOLE AND ONE ADDITIONAL SET OF TESTS AT EVERY MANHOLE. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARDED PROMPTLY TO THE CITY'S DESIGNATED SITE INSPECTOR.
13. THE CONTRACTOR SHALL INSTALL A METALLIZED FOIL LOCATOR TAPE, OR SIMILAR DEVICE AS MAY BE APPROVED BY THE CITY FOR THE FULL LENGTH OF ALL PVC SEWAGE FORCE MAINS. THIS PIPE LOCATOR AID SHALL BE INSTALLED BETWEEN 15" AND 24" BELOW FINISHED GRADE OR AS DIRECTED BY THE MANUFACTURER. TAPE SHALL BE COLOR CODED GREEN FOR SANITARY SEWER AND FORCE MAIN. A No. 12 WIRE SHALL BE INSTALLED WITH WIRE BROUGHT UP AT ALL VALVES.
14. ALL TESTING REQUIRED BY THE CITY SHALL BE PAID FOR BY THE CONTRACTOR/DEVELOPER.
15. ALL LOCAL COLLECTION SANITARY SEWER MANHOLES SHALL BE PRECAST WITH A MINIMUM INSIDE DIAMETER OF 4 FEET.
16. STANDARD MANHOLES SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 350 FEET.

17. ALL SEWER FITTINGS TO BE "HARCO", MULTIFITTINGS, VASSALLO, PLASTIC TREADS, HEAD OR CITY APPROVED EQUAL.
18. MANHOLE RIMS SHALL MATCH FLUSH WITH THE FINISH GRADE ELEVATION IN PAVED AREAS AND A MINIMUM OF 0.2 FEET AND MAXIMUM OF 0.5 FEET ABOVE GRADE GENERALLY IN UNPAVED AREAS.
19. THE CONTRACTOR SHALL CONSTRUCT SANITARY SEWER MANHOLES IN SUCH A WAY THAT SEWER LINES DO NOT INTERSECT SEALED JOINTS BETWEEN SECTIONS OF THE MANHOLE.
20. RUBBER BOOTS AND STAINLESS STEEL BANDS SHALL BE UTILIZED IN THE CONNECTION OF THE SEWER MAIN TO THE MANHOLES (SEE STANDARD MANHOLE AND BOOT DETAIL).
21. INDIVIDUAL SANITARY SERVICE CONNECTORS ON NEW CONSTRUCTION SHALL NOT BE CONNECTED DIRECTLY INTO MANHOLES, AND MUST CONNECTED TO SEWER MAIN LINES BY USE OF WYE CONNECTIONS, UNLESS OTHERWISE BE APPROVED BY THE CITY.
22. FOR SINGLE FAMILY HOMES, SINGLE FOUR INCH SEWER SERVICES LATERALS SHALL BE CONSTRUCTED AT EACH LOT OR UNIT AND LOCATED ON THE DOWNSTREAM SIDE OF THE LOT CENTER LINE. THESE SERVICES SHALL BE EXTENDED 4 FEET ABOVE GROUND AT THE PROPERTY LINE WITH A PVC RISER AND PLUG BEING EASILY VISIBLE FROM THE ROAD. RUBBER SEAL FITTINGS SHALL BE USED ON ALL LINES. NO GLUED JOINTS ARE PERMITTED ON LATERALS.
23. FOR MULTI-FAMILY AND COMMERCIAL SITES, 6 INCH MINIMUM SEWER SERVICES AND CLEANOUTS SHALL BE PROVIDED AS APPROVED BY THE CITY.
24. SANITARY SEWER LIFT STATIONS AND FORCE MAINS, SIZE, MATERIAL, AND DESIGNS SHALL BE APPROVED BY THE CITY. LIFT STATIONS SHALL BE CONSTRUCTED WITH A MINIMUM WET WELL INTERIOR DIAMETER OF 5 FEET. FORCE MAINS SHALL BE A MINIMUM 6 INCH DIAMETER.
25. IT SHALL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO PREPARE AND SUBMIT FLOTATION CALCULATIONS TO SIZE THE BASE OF THE WET WELL, AND ANY MANHOLES AS DEEMED NECESSARY BY THE CITY.
26. SANITARY SEWER DROP MANHOLES SHALL ONLY BE USED UNDER SPECIAL CONDITIONS AS APPROVED BY THE CITY. DROPS LESS THAN 24" SHALL NOT BE ALLOWED.
27. ALL SANITARY SEWER MANHOLE COVERS SHALL HAVE THE WORDS "HOLLY HILLY, FLORIDA SANITARY SEWER" CAST INTO THEM.
28. ALL SANITARY SEWER FORCE MAINS, INCLUDING FITTINGS, SHALL BE PVC AWWA C-900, OR C-905 (COLOR "GREEN") (PRESSURE FITTINGS, PRESSURE CLASS 150 OR C-907) FITTINGS SHALL BE HARCO PVC GASKETED FITTINGS, MULTI-FITTINGS (OR APPROVED EQUAL.) THE FORCE MAIN MINIMUM DEPTH OF COVER SHALL BE 36".
29. ALL SANITARY SEWER FORCE MAINS SHALL USE A THRUST RESTRAINT JOINT METHOD IN COMPLIANCE WITH THE DUCTILE IRON PIPE RESEARCH ASSOCIATION GUIDELINES MODIFIED TO ACCOMMODATE PVC PIPE BY FOLLOWING THE RECOMMENDED INCREASE IN RESTRAINT LENGTH CORRESPONDING TO THE INSTALLATION OF POLYETHYLENE WRAP IN NO INSTANCE SHALL THRUST BLOCKS BE PERMITTED.
30. SANITARY SEWER MANHOLES WHICH HAVE SEWER FORCE MAINS DISCHARGING DIRECTLY INTO THEM SHALL BE FIBERGLASS OR POLY-ETHYLENE LINED. RETRO-FITTING OF MANHOLES WITH LINERS SHALL BE REQUIRED WHEN NEW CONNECTIONS SUCH AS THIS ARE MADE. FIBERGLASS SHALL BE A MINIMUM 1/2" THICKNESS UNLESS APPROVED OTHERWISE BY THE CITY. OTHER TYPES OF LINING METHODS AND MATERIALS MAY BE CONSIDERED ON A CASE BY CASE BASIS. UNDER SPECIAL CIRCUMSTANCES WHERE HYDROGEN SULFIDE IS A MAJOR CONCERN MANHOLES UPSTREAM AND/OR DOWNSTREAM OF THE FORCE MAIN TIE-IN OR WET WELL MAY ALSO BE REQUIRED TO HAVE LININGS INSTALLED.
31. THE CITY SHALL REQUIRE ALL NEW SANITARY SEWER GRAVITY SYSTEMS TO BE SMOKE TESTED PRIOR TO FINAL ACCEPTANCE. ALL TESTING MUST BE DONE IN THE PRESENCE OF THE CITY'S DESIGNATED SITE INSPECTOR.
32. THE CITY OF HOLLY HILL RESERVES THE RIGHT TO REQUIRE THE DEVELOPER TO PERFORM VACUUM TESTING OF ALL SANITARY MANHOLES, AIR TEST SEWER MAINS, AND REQUIRES THAT ALL SANITARY SEWER MAIN LINES BE TELEVIEWED PRIOR TO FINAL ACCEPTANCE. LATERALS SHALL BE TELEVIEWED UPON DEMAND BY THE CITY PRIOR TO FINAL ACCEPTANCE WHEN IT IS SUSPECTED THAT A PROBLEM EXISTS.

33. ALL SEWER MAINS, PRIOR TO ACCEPTANCE BY THE CITY AND PRIOR TO ANY FINAL PAVING OPERATIONS, SHALL BE TELEVIEWED USING A "PAN AND TILT" CAMERA BY A CITY APPROVED CONTRACTOR. THE VIDEO SHALL BE NON-STOP WITH AUDIO DESCRIBING WHAT IS BEING REVIEWED. WRITTEN VIDEO LOGS DESCRIBING THE CONDITION OF THE LINES PER NASCO, PACP, AND MACP STANDARDS SHALL ACCOMPANY THE TAPE SUBMISSION TO THE CITY PRIOR TO COMMENCING ANY INSTALLATION OF ASPHALT OR CONCRETE PAVEMENT. RE-TAPING MAY BE REQUIRED BY THE CITY IF ADDITIONAL CLEARING OR CORRECTIVE ACTIONS ARE NECESSARY.
34. ALL MANHOLES CONSTRUCTED IN SIDE YARDS, BACKYARDS, AND EASEMENTS OUTSIDE OF THE RIGHT-OF-WAY SHALL BE OUTFITTED WITH FIBERGLASS LINERS IN COMPLIANCE WITH ASTM-3753 OR OTHER TYPES OF LINERS APPROVED BY THE CITY. IN ADDITION THE CITY MAY REQUIRE LINERS TO BE INSTALLED IN OTHER AREAS WHERE THE PUBLIC UTILITIES DEPARTMENT BELIEVES THE NEED IS JUSTIFIED SUCH AS IMMEDIATELY UPSTREAM OF FORCE MAINS CONNECTING TO GRAVITY MAINS.
35. ALL SEWER LINES WHICH ARE CONSTRUCTED OUTSIDE OF PUBLIC RIGHTS-OF-WAY WITHIN SIDE YARDS, BACKYARDS, AND OTHER POORLY ACCESSIBLE AREAS SHALL BE CONSTRUCTED OF C-900 PVC. ABSOLUTELY NO USE OF PLASTIC STYRENE FITTINGS SHALL BE ALLOWED.
36. SEWER LATERAL LOCATIONS SHALL BE MARKED ALONG THE OUTSIDE OF THE CURB WITH A SAW CUT "V", OR BY A METAL TAB SET INTO THE PAVEMENT.
37. CONTEC A-2000 PVC PIPE SHALL NOT BE ALLOWED FOR USE.
38. EZ-WRAP PLASTIC, AS MANUFACTURED BY PRESS SEAL GASKET CORPORATION, SHALL BE USED ON THE OUTSIDE OF ALL MANHOLE AND WETWELL JOINTS. APPLY ONE LAYER OF 9" WRAP CENTERED ON EACH JOINT. A CITY INSPECTOR SHALL PERSONALLY INSPECT ALL JOINT SEALS PRIOR TO BACKFILLING OPERATIONS.
39. ALL PROPOSED SEWER FORCE MAINS SHALL BE FLUSHED, PRESSURE TESTED AND CLEARED FOR SERVICE IN ACCORDANCE WITH THE LATEST AWWA STANDARDS AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED SITE INSPECTOR WHO SHALL COORDINATE WITH CITY PERSONNEL AT THE WATER OR WASTEWATER TREATMENT PLANT (AS APPROPRIATE) AT LEAST 48 HOURS PRIOR TO BEGINNING A FULL-DIAMETER FLUSH OF THE MAINS PRIOR TO THE COMMENCEMENT OF PRESSURE TESTING (SUBJECT TO AVAILABILITY).
40. THE CONTRACTOR SHALL BE REQUIRED TO PIG ALL FORCE MAINS IN EXCESS OF 6" IN DIAMETER AND PRIMARY TRANSMISSION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR. ALL PIGGING OPERATIONS SHALL BE WITNESSED BY A HOLLY HILL REPRESENTATIVE OR CITY UTILITY INSPECTOR. (OPTIONAL AT CITY'S DISCRETION.)
41. AS A GENERAL RULE, THE NUMBER OF JOINTS SHALL BE LIMITED WHENEVER POSSIBLE. IN SPECIAL CASES WHERE A POINT REPAIR TO AN 8" TO 12" PVC SEWER MAIN IS REQUIRED, THE PROPER RIGID WRAP AROUND SLEEVE SUCH AS A JCM-210 OVERSIZED DUCTILE IRON COUPLING OR AN APPROVED EQUAL MAY BE ALLOWED BY SPECIAL APPROVAL BY THE CITY.
42. ALL IN-LINE SANITARY SEWER FORCE MAIN VALVES SHALL BE RESILIENT SEAT (AWWA C-509) VALVES FEATURING A LINED DUCTILE IRON BODY.
43. ALL TAPPING OF MAINS AND CORING OF MANHOLES SHALL BE WITNESSED BY THE CITY AND BILLED IN ACCORDANCE WITH THE ADOPTED FEE RESOLUTION. SCHEDULING OF THESE CONNECTIONS SHALL REQUIRE A MINIMUM 48 HOUR NOTIFICATION (MEASURED ON NORMAL WORK DAYS) DIRECTED TO THE CITY'S DESIGNATED SITE INSPECTOR WHO SHALL COORDINATE THE WORK DIRECTLY WITH THE PUBLIC UTILITIES DEPARTMENT. SUBSEQUENTLY, THE CONNECTION SHALL BE SCHEDULED TO COMMENCE BETWEEN 8:00 A.M. AND NOON ON THE APPROPRIATE DAY ESTABLISHED BY CITY.
44. WITH RESPECT TO TIE-IN CONNECTIONS AND CORING OPERATIONS, THE CITY RESERVES THE RIGHT TO REQUIRE CONNECTIONS TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 6:00 A.M.) IN ORDER TO MINIMIZE SERVICE DISRUPTION TO EXISTING CUSTOMERS.
45. ALL WORK PERFORMED UPON SANITARY SEWER FACILITIES OWNED OR PROPOSED TO BE OWNED BY THE CITY SHALL BE CONSTRUCTED BY AN UNDERGROUND UTILITY CONTRACTOR, OR LICENSED GENERAL CONTRACTOR, WHO IS LICENSED IN THE STATE OF FLORIDA AND REGISTERED WITH THE CITY.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

- (1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.
(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

Disclaimer - This document is provided for your convenience only. Please refer to F.A.C. Rule 62-555.314 for additional construction requirements.

7.1.b

Mea & Hunt

Mead and Hunt, Inc.
4401 Eastport Parkwa
Port Orange, FL 3212
phone: 386-761-681C
meadhunt.com
FL Cert. #26730


HOLLY HIL
FLORIDA

These documents shall not be used for any purpose project for which it is not intended. Mead & Hunt's be indemnified by the client and hold harmless on intended from all claims, damages, liabilities, loss and expenses, including attorney's fees and costs arising out of such misuse or reuse of the documents. In addition, unauthorized reproduction of these documents, in part or as a whole, is prohibited.

CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
FLOMICH STREET & RIVERSIDE DRIVE

ISSUED
02-19-2020
BID SET

NOT FOR CONSTRUCT

M&H NO.: 1000710-191037
DATE: FEBRUARY 2021
DESIGNED BY: AMG
DRAWN BY: ADC
CHECKED BY: AEL
DO NOT SCALE DRAWINGS

SHEET CONTENTS
SEWER
CONSTRUCTION
NOTES AND DETAILS

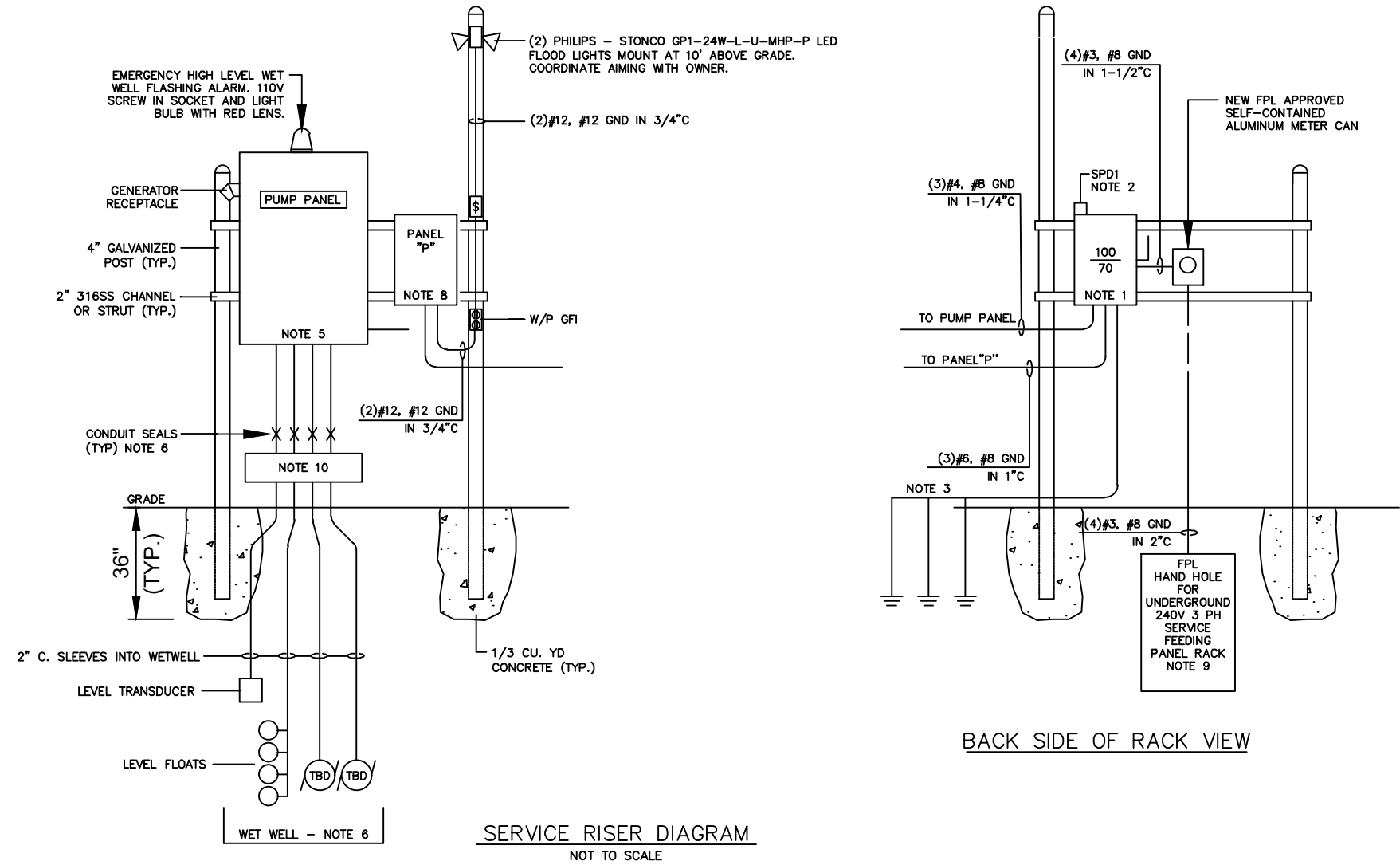
SHEET NO.

C-504

Packet Pg. 494

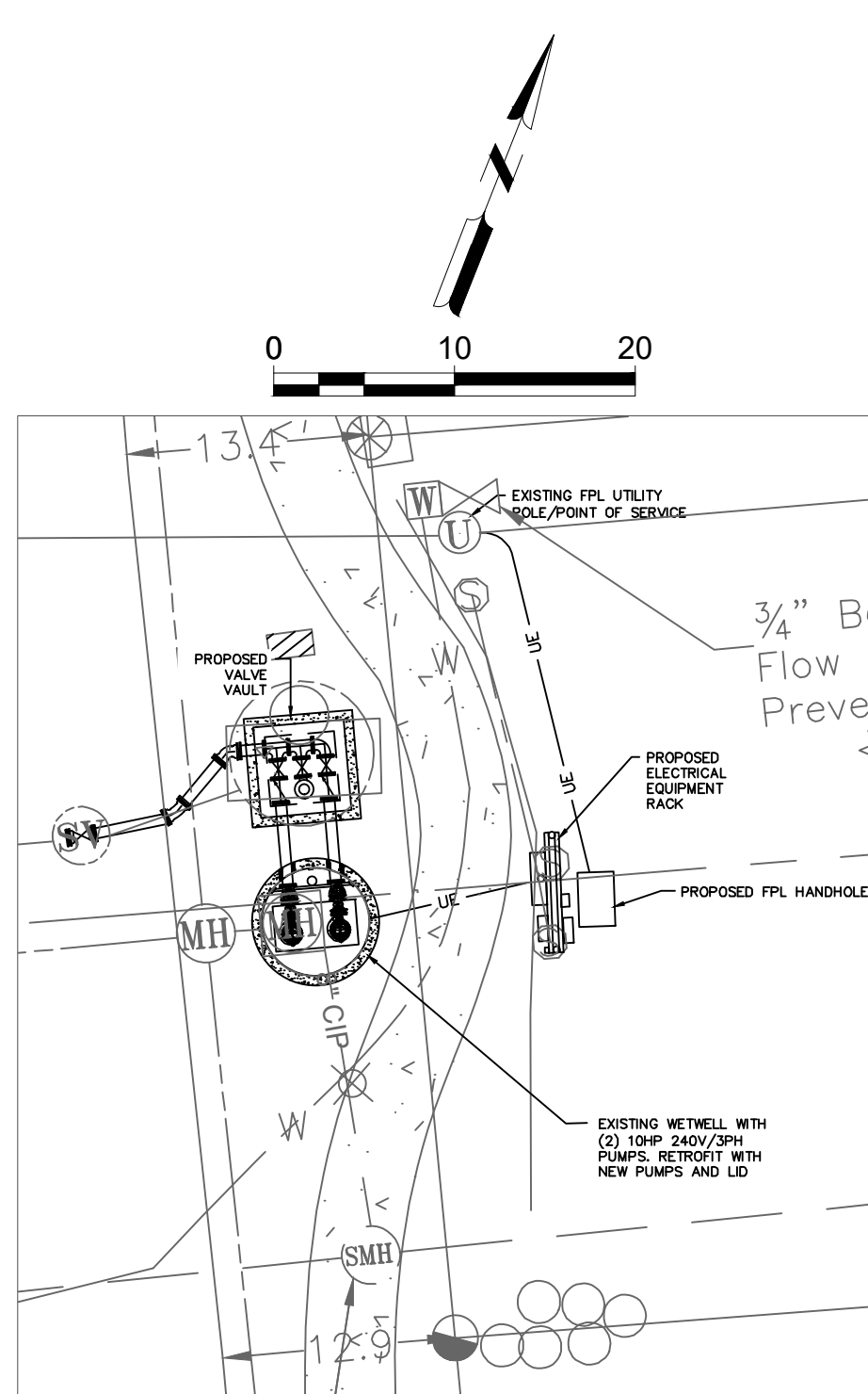
Attachment: HH Lift Station 9 Rehab BID SET (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

\\CORP-MEADHUNT.COM\SHARED\FOLDERS\ENTR\1000710191037.01\TECH\CAD\DRAWINGS\E-501 ELECTRICAL DETAILS.DWG
2/20/2020 4:59:02 PM



LIFT STATION RISER NOTES:

- 100 AMP - 3 POLE - SOLID NEUTRAL, FUSED NEMA 4X DISCONNECT WITH 70 AMP CLASS RK-1 FUSES. LABEL AS "SERVICE MAIN DISCONNECT".
- SPD1 TO BE SURGE ARRESTORS, SQ-D SDSA-3650. SUITABLE FOR 3 PH SERVICE.
- SERVICE GROUND TO INCLUDE #6 BARE COPPER RUN TO THREE (3) 5/8"x10' COPPER CLAD DRIVEN ELECTRODE SPACED AT LEAST 10' APART AND BONDED TO WET WELL EQUIPMENT RACK, CONTROL PANELS, TELEMETRY PANELS, WET WELL TOP PLATE AND ALL SECURITY FENCE POSTS. RESISTANCE TO GROUND TO BE A 25 OHMS OR LESS. EXOTHERMIC WELD GROUND WIRES TO ELECTRODES. INCLUDE BATTERY BACKUP AND SPARE SC-2000 PUMP CONTROLLER WITH PANEL.
- ALL CONDUITS AND FITTINGS TO BE SCH80 PVC UNLESS NOTED OTHERWISE.
- NEMA 4X 316SS CONTROL PANEL TO BE FURNISHED BY PUMP VENDOR. MOUNT ON THE RACK PER DETAIL AND PROVIDE POWER SUPPLY, WIRING, ETC. TO SERVE NEW LIFT STATION EQUIPMENT. CONTROL PANEL WILL INCLUDE VISIBLE AND AUDIBLE ALARM FOR HIGH FLOW CONDITION AND INCLUDE ELAPSED RUN TIME METERS FOR EACH PUMP AND 240V/3PH GENERATOR RECEPTACLE.
- PROVIDE CONDUIT SLEEVES AND SEAL-OFFS INTO WET WELL FOR FLOAT SWITCHES AND PUMP CABLES PROVIDED BY VENDOR WITH CONTROL PANEL ASSEMBLY. INSTALL CONDUIT SEALS ABOVE TERMINAL BOX AND 12" MINIMUM ABOVE GRADE TO PREVENT MOISTURE AND GAS INTRUSION INTO CONTROL PANEL.
- LEVEL FLOATS, LEVEL SENSOR AND MOTORS INCLUDING CABLES AND CONNECTIONS TO BE PROVIDED BY PUMP CONTROL PANEL VENDOR. COORDINATE INSTALLATION AND WIRING ACCORDINGLY. MAKE ALL TERMINATIONS AS REQUIRED BY THAT VENDOR USING APPROVED MATERIALS AND METHODS.
- INSTALL PANEL "P" INSIDE A 20"x16"x8" NEMA 4X 316SS HINGED DOOR BOX WITH A PAD LOCKABLE HANDLE.
- CONTRACTOR TO INSTALL UG CONDUIT FROM THE EXISTING SERVICE DROP POLE TO FPL HANDHOLE AT BASE OF ELECTRICAL EQUIPMENT RACK.
- MOUNT A 16"x16"x6" NEMA 4X 316SS HINGED COVER TERMINAL BOX WITH INSULATED TERMINAL STRIP TO FACILITATE PUMP REMOVALS.
- SERVICE TO BE UNDERGROUND 240V - 3 PH - 4 WIRE "OPEN DELTA" FROM FPL. COORDINATE SERVICE SOURCE AND CONNECTION WITH FPL.
- ALL WIRING TO BE THWN FROM METER CAN TO PANEL AND FPL APPROVED UNDERGROUND WIRING FOR THE SERVICE DISCONNECT CONNECTION.
- MEET ALL NEC 2017 AND LOCAL CODE REQUIREMENTS.
- DATA FLOW SYSTEMS (DFS) SHALL PROVIDE TELEMETRY CONTROL UNIT AND ANTENNA. CONTRACTOR TO COORDINATE WITH DFS ON THE INSTALLATION. CONTACT AT DFS IS TOM HOGELAND (321) 514-9788.



PANEL: P							
MFG.	SQ D	VOLTAGE	240	PHASE	1	WIRE	4
CAT.	Q0612L60S	AMPS.	60	SYM.	A.I.C. (I.E.R.)		
MOUNT	SURFACE	MAIN	LUG	GRD. BUS	X		
NEMA 1 ENCL MOUNTED IN NEMA 4X ENCLOSURE PER NOTE 7.							
CT	DESCRIPTION	POLE	AMPS	WIRE	COND	Ø A	Ø B
1	OUTLET	1	20	#12	1/2"		
2	LIGHTS	1	20	#12	1/2"		
3	SPARE						
4	MAIN-BACK FED	2	60	#6	1"		

CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
FLOMICH STREET & RIVERSIDE DRIVE

ISSUED
02-19-2020
BID SET

NOT FOR CONSTRUCT

M&H NO.: 1000710-191037
DATE: FEBRUARY 2021
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DRAWN BY: ADC
CHECKED BY: AEL
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ELECTRICAL DETAILS

SHEET NO.

E-501

Lift Station #9 Bid Opening	
Vendor	Cost
Santik Inc.	\$334,830.00
Prime Construction	\$387,750.00
Hinterland Group	\$283,270.00
Black Sands	\$319,761.98
Cane Enterprises	\$249,999.00
Danus Utilities	\$257,816.00
Petticoat Schmidt	\$250,690.00
Inter County Engineering	\$347,000.00
US Water Services Corp	\$389,088.00

**SECTION 00 30 00
PROPOSAL
FOR
CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
BID NO. 20-WW-01**

(To be completed in Duplicate)

Bidder's Name: Cain Enterprises LLC dba Engineering
Solutions International

Submitted: 4/27/2020

City of Holly Hill
City Clerk
1065 Ridgewood Avenue
Holly Hill, FL 32117

Gentlemen:

The undersigned, as Bidder, hereby declares that the only person or persons interested in the Proposal, as principal or principals, is or are named herein and that no other persons than herein mentioned has any interest in the Proposal or the Contract to which the work pertains; that this Proposal is made without connection or arrangement with any other person, company, or parties making a bid or proposal and that the Proposal is in all respects fair and made in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and that from personal knowledge and experience, or that he/she has made sufficient test holes and/or other subsurface investigations to fully satisfy self that such site is a correct and suitable one for this work and he/she assumes full responsibility therefore; that he/she is familiar with all legal requirements (Federal, State and local laws, ordinances, rules and regulations) pertaining to the Work; that he/she has examined the Drawings and Specifications for the work and from his/her own experience or from professional advice that the Drawings and Specifications are sufficient for the work to be done and he/she has examined the other Contract Documents and all addenda relating thereto, and that he/she has satisfied himself/herself fully, relative to all matters and conditions with respect to the work to which this Proposal pertains.

The Bidder proposes and agrees, if this Proposal is accepted, to contract with the City of Holly Hill, (Owner) in the form of contract specified, to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, and labor and to perform all work necessary to complete the Work specified in the Proposal and other Contract Documents.

The Bidder further proposes and agrees to comply in all respects with the time limits for commencement and completion of the Work as stated in the Contract Form.

The Bidder further agrees that the deductions for liquidated damages, as stated in the Contract Form, constitute fixed and agreed liquidated damages to reimburse the Owner for additional costs to the Owner resulting from the Work not being completed within the time limit stated in the Contract Form.

The Bidder further agrees to execute a Contract and furnish satisfactory Performance and Payment Bonds, each in the amount of one-hundred percent of the Contract price, and the required Certificates of Insurance, within ten consecutive calendar days after written notice being given by the Owner of the award of the Contract, and the undersigned agrees that in case of failure on his/her part to execute the said Contract, Performance and Payment Bonds and Insurance Certificates within ten (10) consecutive calendar days after the award of the Contract, the bid guarantee accompanying his/her bid and the money payable thereon shall be paid to the Owner as liquidation of damages sustained by the Owner; otherwise, the bid guarantee shall be returned to the undersigned within fifteen days after the Contract is signed and the Performance and Payment Bonds and Insurance Certificates are filed.

The undersigned agrees to accept as full compensation for completion of the project in full compliance with the Contract Documents, the unit prices for the items named in Section 00 31 00, Schedule of Unit Prices, submitted herein with this Proposal.

The undersigned offers to furnish all materials, equipment and labor for construction of,

LIFT STATION #9 REPLACEMENT

for the City of Holly Hill, Florida, complete in every respect in strict accordance with the drawings, specifications and any future changes therein. The Contractor shall perform these obligations for the prices listed in the "Schedule of Unit Prices: Section 00 31 00" attached and made a part of this Bid. **The bid total is:**

Two hundred forty nine thousand nine hundred ninety nine dollars and zero cents (In Words)

Dollars \$ 249,999.00 (In Figures)

COMPLETION TIME OF CONTRACT

The Contractor agrees that the work shall be started not later than the date indicated in the Notice to Proceed and that the total work shall be substantially completed within **150 days** and final completion within **30 days** of substantial completion.

The Contractor further agrees that for each calendar day, with the exception of Sundays and legal holidays that any work shall remain uncompleted after the stations completion times stipulated above the sum of **\$500 (Five Hundred Dollars)** per day shall be deducted from monies due the

contractor, not as a penalty, but as liquidated damages. If the Contractor is declared in default in accordance with the provisions of the Specifications, liquidated damages shall be charged as provided herein, and such amounts shall be deducted from the final amount payable to the Contractor or his/her Surety. Should the total amount chargeable as liquidated damages exceed the amount due or payable to the Contractor or his/her Surety, then such excess shall be paid to the Owner by the Contractor or his/her Surety.

SUPPLEMENTAL REQUIREMENTS

The following documents are attached to and made a condition of this bid:

Schedule of Unit Prices: Section 00 31 00
 Statement of Bidder's Qualifications: 00 32 00
 Listing of Subcontractors: Section 00 33 00
 Listing of Previous Experience: Section 00 33 10
 Bid Bond: Section 00 41 00
 Public Entity Crimes Statement: Section 00 47 00
 Anti-Collusion Statement: Section 00 48 00
 Drug Free/Tie Preference Statement: Section 00 48 50
 Trench Safety Affidavit: Section 00 49 00
 Certificate as to Corporate Principal: Section 00 62 00
 City of Holly Hill Insurance Requirements: Section 00 80 00A
 W9 Request for Taxpayer Identification Number and Certification

REQUIRED DISCLOSURE

At its sole discretion, the City of Holly Hill, Florida may reject any bidder the City finds to lack, or whose present or former executive employees, officers, directors, stockholders, partners or owners are found by the City to lack honesty, integrity, or moral responsibility. The discretion of the City may be exercised based on the City's own investigation, public records, or any other reliable sources of information. By submitting a bid, bidder recognizes and accepts that the City may reject the bid based upon the exercise of its sole discretion and bidder waives any claim it might have for damages or other relief resulting from the rejection of its bid based on these grounds.

SCHEDULE OF MAJOR MANUFACTURERS AND SUPPLIERS

The equipment manufacturers/suppliers on this project shall be as delineated in the following schedule. Bidders should note that the Owner and Engineer have made rigorous investigations of equipment performance and features, and as a result, Bidders are to note that the contract price for this project shall be based on Base Bid equipment. The Base Bid equipment for this project falls under one of two categories. The first category is equipment that the Owner and Engineer have determined will be supplied by a sole source of supply, for which no substitutions or alternates will be entertained or allowed. Bidder is advised that offering of any alternatives to the sole source supplied equipment will be grounds for rejection of his bid as not responsive. The second category of equipment includes those items where the Owner and Engineer deem there to be more than one acceptable supplier of the particular item listed. The equipment which falls under these two categories is shown on the subsequent pages of this Schedule of Major Manufacturers and

Suppliers. Bidder is advised that the award of this Contract will be based solely on the use of Base Bid equipment.

The following comments relate only to the second category of equipment, where the Contract Documents are based upon the equipment or products available from the suppliers denoted as A, B, C, etc. below. These equipment manufacturers, along with the sole source suppliers constitute the Base Bid.

Provision is made in the Contract Documents for alternate manufacturers and suppliers whose equipment or product may be deemed equivalent in quality (see General Conditions). However, the Bidder must indicate in his Bid which Base Bid supplier he intends to use for each item of equipment listed by circling one of the listed manufacturers/suppliers. If the Bidder fails to indicate which listed manufacturer/supplier he intends to use if an alternate is rejected, he must use the supplier listed as "A". Also, if the Bidder circles more than one listed supplier, he must use the first supplier circled (unless an alternate is approved).

If the Bidder desires to propose one or more alternate manufacturers/suppliers, he may write in the name of such alternates in the spaces provided on the Alternate Manufacturers/Suppliers page following the schedule. He must, nevertheless, also circle one of the listed manufacturers/suppliers because Bidders' Bid price must be based upon this Base Bid list. Wherever an alternate supplier is proposed, the Bidder must insert the amount to be deducted from the Contract Price (either lump sum or unit price) if the alternate supplier is eventually approved. If the proposed alternate supplier is determined "not equivalent" by the Engineer, the Bidder must use the circled supplier.

For any alternate supplier accepted by the Owner, the Contract Price will be reduced by the deductive amount stated in the Bid. However, the Contract Price will not be adjusted for any alternate supplier rejected.

Each proposed alternate will be evaluated in accordance with the General Conditions.

The deductive amount specified for alternate manufacturers/suppliers will not be used in determining the successful Bidder. Alternates will be considered only after award of the contract.

The Contractor shall reimburse the Owner for any costs directly attributable to the change in suppliers, such as additional field trips for the Engineer, additional redesign costs, additional review and inspection costs, etc.

The Owner may request and the Bidder shall supply complete information on proposed alternates prior to the Notice of Award.

SCHEDULE OF MAJOR MANUFACTURERS
AND SUPPLIERS

Category I - Sole Source Equipment Items:

Item No.	Spec. No.	Equipment/Material	Manufacturer or Supplier
		pumps	ABS pumps

Category II - Major Equipment Items:

ALTERNATE MANUFACTURERS/SUPPLIERS

EQUIPMENT ITEM MATERIAL	SPEC. SECTION	ALTERNATIVE MANUFACTURER / SUPPLIER (LIST ONE ONLY)	DEDUCTIBLE AMOUNT (indicate whether lump sum or unit price) ALTERNATE
1. <u>NA</u>			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			

Name (signature)

Date

Fred Lane

Name (typed and printed)

General Manager

Title

ACKNOWLEDGMENT OF ADDENDA

Addenda will be issued via email and it is the Bidder's responsibility to confirm that all addenda have been received prior to submitting a bid for the project. Acknowledgment is hereby made of the following Addenda received since issuance of Drawings and Specifications:

Addendum No. <u>1</u>	Dated: <u>4-10-2020</u>	Addendum No. _____	Dated: _____
Addendum No. <u>2</u>	Dated: <u>4-10-2020</u>	Addendum No. _____	Dated: _____
Addendum No. <u>3</u>	Dated: <u>4-24-2020</u>	Addendum No. _____	Dated: _____

Attached hereto is a cashier's check on the _____ Bank of _____ or Bid Bond for the sum of 5% Dollars (_____), made payable to City of Holly Hill (Owner).

Cain Enterprises LLC
Engineering Solutions International
 (Name of Bidder) (Affix Seal)

 (Signature of Officer)

Fred Lane - General Manager
 (Title of Officer)

Cain Enterprises LLC
Engineering Solutions International
 Name of Bidder

32 NE 16th St.

Address

Ocala, FL 34470

City/State/Zip

(352) 390-6555

Telephone

CBC 045628 and CUC 048362

Contractor's Florida License Number

The full names and residences of persons and firms interested in the foregoing bid, as principals, are as follows:

Fred Lane 2960 SE 36th Ln, Ocala, FL 34471

Lee Cain 116 Ledbury Dr, Longwood, FL 32779

END OF SECTION

Project name:	<u>Lift Station # 9 Rehabilitation</u>	Client:	<u>City of Holly Hill</u>
	<u>Intersection of Flomich St. and</u>		
Project location:	<u>Riverside Drive</u>	Client representative:	<u>Antoine Koury, PE</u>
Project number:	<u>RFQ 20-WW-01</u>	Mead & Hunt, Inc. manager:	<u>Andrew Giannini, PE</u>
Date:	<u>April 10, 2020</u>	Mead & Hunt Inc. phone:	<u>(386) 761-6810</u>

**ADDENDUM NUMBER 1
RFP 20-WW-01
LIFT STATION #9 REPLACEMENT
CITY OF HOLLY HILL**

To All Plan Holders:

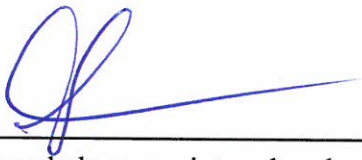
The following changes, clarifications and additions are hereby made part of the **RFP 20-WW-01** for the above **LIFT STATION #9 REPLACEMENT** as fully and completely as if the same were fully set forth therein. All required forms (must be included in the submitted proposals and all bids **MUST** be submitted or your bid may be declared Non-Responsive.

There will be a non-mandatory pre-bid meeting for this project at 2:00 p.m. on April 7, 2020. The meeting will be held via teleconference by calling +1(646)749-3131, with access code of 300-729-717.

QUESTIONS AND ANSWERS

Q1. Is there an Engineer's Estimate for the above referenced project?

A1. Engineer's Estimate is \$3,20,908.50



Signature acknowledges receipt and understanding of this addendum.

Fred Lane - General Manager

Name/Title

April 27, 2020

Date

RFP 20-WW-01 LIFT STATION #9 REPLACEMENT



FLORIDA DEPARTMENT OF Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

PERMITTEE:

City of Holly Hill
453 LPGA Boulevard
Holly Hill, FL 32117
Walt Smyser, Public Works Deputy
Director

Email: wsmyser@hollyhillfl.org

PERMIT NUMBER:

0384140-001-DWC/CG

ISSUE DATE:

February 18, 2020

EXPIRATION DATE:

February 17, 2025

COUNTY:

Volusia

PROJECT NAME:

Holly Hill Lift Station 9

CONNECTED TO:

Holly Hill WRF

FACILITY ID:

FL0027677

Dear Mr. Smyser:

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our office received the Notice on February 10, 2020. This project includes the construction of a lift station connecting to upstream and downstream existing facilities on same site.

This is to advise you that the Department does not object to your use of such General Permit.

Please note the attached requirements apply to your use of this General Permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

Sincerely,

Osama Mahmoud
Engineer
Permitting and Waste Cleanup Program

OHM/ohm

cc: Andrew Giannini, PE, Mead and Hunt, Andrew.giannini@meadhunt.com
Charles LeGros, DEP, Charles.LeGros@dep.state.fl.us
Osama Mahmoud, DEP, Osama.mahmoud@dep.state.fl.us
Reggie Phillips, DEP, reggie.phillips@floridadep.gov

Attachment: Holly Hill Lift Station #9 Replacement 20-WW-01-Cain dba ESI (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at:
<http://www.dep.state.fl.us/legal/Rules/shared/62-4/62-4.pdf> [62-4.540]
2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]
3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]
5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Central District Office Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: <http://www.dep.state.fl.us/water/wastewater/dom/dw-forms.htm>. [62-604.700(2)]

Please submit the entire clearance document package in electronic format to DEP_CD@dep.state.fl.us, with a copy to Osama.mahmoud@dep.state.fl.us . If the file is very large, you may post it to the Wastewater Electronic Applications folder on the following ftp site at:

<ftp://ftp.dep.state.fl.us/pub/wastewater/>

After posting the document, send an e-mail to DEP_CD@dep.state.fl.us, with a copy to Osama.mahmoud@dep.state.fl.us , alerting us that it has been posted. Any submitted drawings (should be sized 11" x 17") and the engineer of record's signed seal and dates on the required document must be legible for acceptance.

For further clarification contact:
(Osama Mahmoud), (407) 897-4125
3319 Maguire Blvd, Suite 232
Orlando, Florida 32803-3767

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]
7. Abnormal events shall be reported to the Department's Central District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800)320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Central District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

PRE-BID NOTES

CITY OF HOLLY HILL

BID NO. 20WW-01

LIFT STATION #9 REPLACEMENT

DATE OF MEETING: APRIL 7, 2020

Attendees: John Daly, Richard Glass, Steve Juengst , Antoine Khoury, Stella Gurnee - City of Holly Hill

Andrew Giannini – Mead & Hunt

John Justus - McMahan

John Wharton - Black Sand;

Kerry Cook - Sunbelt Rental Pump Solutions

Preston Pardus - Danus Utilities

Edina Toth Volusia County CDBG

Project Scope: The LS 9 replacement includes conversion of can lift station to submersible station; work includes bypass pumping, demolition of two existing pumps, piping/valves to abandon pump can, installation of two new submersible pumps, top slab piping and valves, valve vault, electrical panel and control panel.

Location is at Flomich/Riverside Drive intersection, work will be hazardous due to close proximity to edge of pavement, MOT is critical; City standardized to Sulzer pumps (ABS); converting everything on control to Data Flow for telemetry; tied into existing FM - open cut - tie it into new 6" gate valve.

Questions/Answers:

1. Can Riverside Drive be shut down?
 - a. No, one lane with flagmen will be allowed when tying into the FM (certain times of the day).
2. It was noted in the specs that bypass pumping will require two set-ups, one back-up – is this applicable to this project?
 - a. Silent night packages to keep noise down? Back up not required but if Contractor wants to put in a secondary to prevent issues, they can do that.
3. Bypass electric or diesel?
 - a. Can be electric; preferred as it is quieter.
4. The plans call for a ball valve in valve vault(see sheet C-501). Is this correct?
 - a. Yes, the City prefers ball valves.
5. There are two flow conditions in the bid docs for bypass pumping and final LS flow. Specifications list 200 GPM at 80 psi; Sheet C-501 states differently.

- a. Disregard 200 gpm at 80 psi. Use pump flow conditions on plans.
6. Is a Cushioned check valve (sheet C-501) really what the City wants in the valve box?
 - a. The check valve shall be a outside lever and weight with no cushioning.
7. Kindly send the current plan holders list. (Last version on file is dated March 24.)
 - a. The List on Myvendorlink.com is the most current.
8. Bid date and time: 04/28/2020 at 2:00pm ET
 - a. Yes, the bid is due 4/28/2020 at 2:00 pm ET.
9. The Start date: 05/28/2020?
 - a. The Start date will be indicated on the Notice to Proceed.
10. End date: Is there an anticipated end date for the project?
 - a. Substantial completion within 150 days of started date and final completion within 30 days of substantial completion.
11. Project value?
 - a. \$320,908.50
12. Award date: 05/12/2020?
 - a. Anticipated award date 5/12/2020
13. Are there any addendums to soon be released?
 - a. This Addendum 2 is the most current addendum.

CDBG requirements were discussed:

- Contractor must be free of any Federal debarments; additional paperwork required for MBE/WBE goals, Davis-Bacon weekly certified payroll, etc.
- Federally funded project, no local preference in place; Davis-Bacon wages apply - check the most recent DOL for heavy construction rates before submitting bid.

Deadline to submit questions is April 23, 2020. Addendum will be prepared. Bids due April 28 by 2 PM. A conference call will be used for bid opening similar to pre-bid meeting.

Deliver bids via mail, or drop box at City Hall

Email contact information to Stella Gurnee sgurnee@hollyhillfl.org



Addendum 2

7.1.d

Project name: Lift Station # 9 Rehabilitation Client: City of Holly Hill
Intersection of Flomich St. and
Project location: Riverside Drive Client representative: Antoine Koury, PE
Project number: RFQ 20-WW-01 Mead & Hunt, Inc. manager: Andrew Giannini, PE
Date: April 10, 2020 Mead & Hunt Inc. phone: (386) 761-6810

TO ALL BIDDERS: You are requested to make all changes and/or additions contained in this Addendum to the Bidding Documents. Failure to acknowledge this Addendum in Proposal shall result in rejection of bid.

I. GENERAL

- A. FDEP General Permit for Domestic Wastewater Collection/Transmission is included with this addendum. The Contractor shall comply with all conditions of the permit.

See attached pre-bid meeting notes for questions from the pre-bid meeting with responses

BID DATE AND TIME SHOULD CORRESPOND TO DATE AND TIME INDICATED IN ADVERTISEMENT FOR BIDS, UNLESS DATE AND TIME HAS BEEN CHANGED IN THIS OR PREVIOUS ADDENDUMS.

END OF ADDENDUM

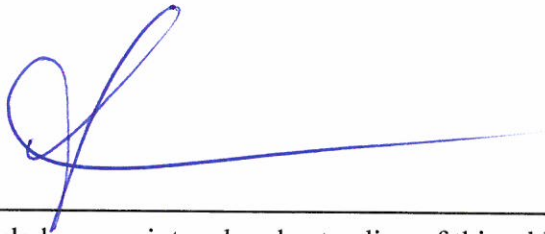
Disclaimer: This addendum was posted on Vendor Link. It is the sole responsibility of the bidder to confirm that all addenda have been received prior to submitting bid and acknowledge such in the bid documents.

Attachment: Holly Hill Lift Station #9 Replacement 20-WW-01-Cain dba ESI (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award

**ADDENDUM NUMBER 2
RFP 20-WW-01
LIFT STATION #9 REPLACEMENT
CITY OF HOLLY HILL**

To All Plan Holders:

The following changes, clarifications and additions are hereby made part of the **RFP 20-WW-01** for the above **LIFT STATION #9 REPLACEMENT** as fully and completely as if the same were fully set forth therein. All required forms (must be included in the submitted proposals and all bids **MUST** be submitted or your bid may be declared Non-Responsive.



Signature acknowledges receipt and understanding of this addendum.

Fred Lane - General Manager
Name/Title

April 24, 2020
Date

RFP 20-WW-01 LIFT STATION #9 REPLACEMENT

Attachment: Holly Hill Lift Station #9 Replacement 20-WW-01-Cain dba ESI (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award



FLORIDA DEPARTMENT OF Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

PERMITTEE:

City of Holly Hill
453 LPGA Boulevard
Holly Hill, FL 32117
Walt Smyser, Public Works Deputy
Director

Email: wsmyser@hollyhillfl.org

PERMIT NUMBER:

0384140-001-DWC/CG

ISSUE DATE:

February 18, 2020

EXPIRATION DATE:

February 17, 2025

COUNTY:

Volusia

PROJECT NAME:

Holly Hill Lift Station 9

CONNECTED TO:

Holly Hill WRF

FACILITY ID:

FL0027677

Dear Mr. Smyser:

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our office received the Notice on February 10, 2020. This project includes the construction of a lift station connecting to upstream and downstream existing facilities on same site.

This is to advise you that the Department does not object to your use of such General Permit.

Please note the attached requirements apply to your use of this General Permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

Sincerely,

Osama Mahmoud
Engineer
Permitting and Waste Cleanup Program

OHM/ohm

cc: Andrew Giannini, PE, Mead and Hunt, Andrew.giannini@meadhunt.com
Charles LeGros, DEP, Charles.LeGros@dep.state.fl.us
Osama Mahmoud, DEP, Osama.mahmoud@dep.state.fl.us
Reggie Phillips, DEP, reggie.phillips@floridadep.gov

Attachment: Holly Hill Lift Station #9 Replacement 20-WW-01-Cain dba ESI (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at:
<http://www.dep.state.fl.us/legal/Rules/shared/62-4/62-4.pdf> [62-4.540]
2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]
3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]
5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Central District Office Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: <http://www.dep.state.fl.us/water/wastewater/dom/dw-forms.htm>. [62-604.700(2)]

Please submit the entire clearance document package in electronic format to DEP_CD@dep.state.fl.us, with a copy to Osama.mahmoud@dep.state.fl.us . If the file is very large, you may post it to the Wastewater Electronic Applications folder on the following ftp site at:

<ftp://ftp.dep.state.fl.us/pub/wastewater/>

After posting the document, send an e-mail to DEP_CD@dep.state.fl.us, with a copy to Osama.mahmoud@dep.state.fl.us , alerting us that it has been posted. Any submitted drawings (should be sized 11" x 17") and the engineer of record's signed seal and dates on the required document must be legible for acceptance.

For further clarification contact:
(Osama Mahmoud), (407) 897-4125
3319 Maguire Blvd, Suite 232
Orlando, Florida 32803-3767

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]
7. Abnormal events shall be reported to the Department's Central District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800)320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Central District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

PRE-BID NOTES

CITY OF HOLLY HILL

BID NO. 20WW-01

LIFT STATION #9 REPLACEMENT

DATE OF MEETING: APRIL 7, 2020

Attendees: John Daly, Richard Glass, Steve Juengst , Antoine Khoury, Stella Gurnee - City of Holly Hill

Andrew Giannini – Mead & Hunt

John Justus - McMahan

John Wharton - Black Sand;

Kerry Cook - Sunbelt Rental Pump Solutions

Preston Pardus - Danus Utilities

Edina Toth Volusia County CDBG

Project Scope: The LS 9 replacement includes conversion of can lift station to submersible station; work includes bypass pumping, demolition of two existing pumps, piping/valves to abandon pump can, installation of two new submersible pumps, top slab piping and valves, valve vault, electrical panel and control panel.

Location is at Flomich/Riverside Drive intersection, work will be hazardous due to close proximity to edge of pavement, MOT is critical; City standardized to Sulzer pumps (ABS); converting everything on control to Data Flow for telemetry; tied into existing FM - open cut - tie it into new 6" gate valve.

Questions/Answers:

1. Can Riverside Drive be shut down?
 - a. No, one lane with flagmen will be allowed when tying into the FM (certain times of the day).
2. It was noted in the specs that bypass pumping will require two set-ups, one back-up – is this applicable to this project?
 - a. Silent night packages to keep noise down? Back up not required but if Contractor wants to put in a secondary to prevent issues, they can do that.
3. Bypass electric or diesel?
 - a. Can be electric; preferred as it is quieter.
4. The plans call for a ball valve in valve vault(see sheet C-501). Is this correct?
 - a. Yes, the City prefers ball valves.
5. There are two flow conditions in the bid docs for bypass pumping and final LS flow. Specifications list 200 GPM at 80 psi; Sheet C-501 states differently.

- a. Disregard 200 gpm at 80 psi. Use pump flow conditions on plans.
6. Is a Cushioned check valve (sheet C-501) really what the City wants in the valve box?
 - a. The check valve shall be a outside lever and weight with no cushioning.
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 - a. \$320,908.50
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13. Are there any addendums to soon be released?
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CDBG requirements were discussed:

- Contractor must be free of any Federal debarments; additional paperwork required for MBE/WBE goals, Davis-Bacon weekly certified payroll, etc.
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Deadline to submit questions is April 23, 2020. Addendum will be prepared. Bids due April 28 by 2 PM. A conference call will be used for bid opening similar to pre-bid meeting.

Deliver bids via mail, or drop box at City Hall

Email contact information to Stella Gurnee sgurnee@hollyhillfl.org



Addendum 3

Project name:	Lift Station # 9 Rehabilitation	Client:	City of Holly Hill
	Intersection of Flomich St. and		
Project location:	Riverside Drive	Client representative:	Antoine Khoury, PE
Project number:	RFQ 20-WW-01	Mead & Hunt, Inc. manager:	Andrew Giannini, PE
Date:	April 24, 2020	Mead & Hunt Inc. phone:	(386) 761-6810

TO ALL BIDDERS: You are requested to make all changes and/or additions contained in this Addendum to the Bidding Documents. Failure to acknowledge this Addendum in Proposal shall result in rejection of bid.

I. GENERAL

- a. The Data Flow Systems equipment installation shall be included in the cost of the lift station. Please see the contact for DFS on the plans for obtaining costs.

BID DATE AND TIME SHOULD CORRESPOND TO DATE AND TIME INDICATED IN ADVERTISEMENT FOR BIDS, UNLESS DATE AND TIME HAS BEEN CHANGED IN THIS OR PREVIOUS ADDENDUMS.

QUESTIONS

1. Panel Manufacturer: Can we use a Seimens panel in lieu of Square D? We have no local Rep for Square D and will have to order thru Seimens and pay an additional mark-up.

Answer: Seimens panel is fine. The contractor will be responsible to coordinate with DFS and pay for the panel as part of the bid. The LS has to be fully operational when it is turned over including the RTU.

2. Spec Section C-501 Note 7: Can we use SDR 11 Pipe in lieu of SDR 9? Note 7 calls for SDR 9 Pipe; SDR 11 is more than sufficient and SDR 9 is not readily available.

Answer: SDR11 is acceptable to use.

3. Force Main: Does the force main pump to gravity line or into another force main? If the latter, what is the head pressure on the existing line?

Answer: It feeds into a manhole and then outfalls to a gravity line.

4. Spec Section E-501 Note 10: Will pump control company supply this piece with terminal strips in it?

Answer: No.

LS #9 Replacement
Addendum 3

5. Spec Section E-501 Note 3: Include battery back-up and spare SC-2000 pump controller with panel. Is located with groundings, electrician thinks it is the wrong place.

Answer: No need for battery backup and the spare pump controller.

6. Does the Lift Station have to stay on bypass until required DEP clearance (per permit requirements)? If yes, how long for clearance?

Answer: Yes, the system will need to stay in bypass mode until clearance is received by FDEP. Clearance usually takes 2-3 weeks depending on their backlog, and with the current climate, it could be longer.

7. With regard to Project 4999197 - Lift Station #9 Replacement. We would request that Ebara Pumps Americas Corp. be added to the acceptable pump manufacturers list for section 33 32 20 - COLLECTION SYSTEM SUBMERSIBLE PUMPS

Answer: The specified pump in the bid is the standard for Holly Hill and the City will not accept any alternative.

8. REF: C-141, SITE PLAN NOTES, Note 3 – Thank you for this clear direction. Please also clarify if the upstream pump station can be pumped down to create a time-period of no flow in order to make connections (temporary and permanent) to the existing Force Main. What is that calculated time frame? If not, what is the calculated low flow during the night?

Answer: The City will be able to pump the system to allow connection of the new force main. The time is subject to manpower availability. The contractor will be responsible for coordinating with the City.

9. REF: C-141 – There are removable bollards that seem to be new. Please confirm that they are to be included in the bid.

Answer: Disregard, the bollards will be placed with a separate project in this area.

10. REF: C-141 – Please clarify what is meant by “restore sidewalk with asphalt millings”.

Answer: The City will be restoring the sidewalk in a separate project so we need to restore with asphalt millings temporarily.

11. Addendum 1 contained a signature requirement, however Addendum 2 does not. I have attached copy of documents received for both. Should we have Addendum 2 signed and returned along with bid package?

LS #9 Replacement
Addendum 3

Answer: There are signature requirements for all addenda. They are now included in Vendor Link.

12. Will electronic submittal be allowed via vendor link? If so is an electronic copy of bid bond sufficient or will the hard copy need to be delivered by current due date & time?

Answer: Electronic submittals will not be accepted for this bid.

13. Please advise if this project is a "certain federally assisted project" that requires the Section 3 Certification and Existing Workforce sheet to be included as part of the bid package. It is in the technical specifications as such, but not on the list of necessary documents as part of the bid package.

Answer: The certification will be required upon award of the contract to the successful bidder.

END OF ADDENDUM

Disclaimer: This addendum was posted on Vendor Link. It is the sole responsibility of the bidder to confirm that all addenda have been received prior to submitting bid and acknowledge such in the bid documents.

**ADDENDUM NUMBER 3
RFP 20-WW-01
LIFT STATION #9 REPLACEMENT
CITY OF HOLLY HILL**

To All Plan Holders:

The following changes, clarifications and additions are hereby made part of the **RFP 20-WW-01** for the above **LIFT STATION #9 REPLACEMENT** as fully and completely as if the same were fully set forth therein. All required forms (must be included in the submitted proposals and all bids **MUST** be submitted or your bid may be declared Non-Responsive.



Signature acknowledges receipt and understanding of this addendum.

Fred Lane - General Manager
Name/Title

April 24, 2020
Date

RFP 20-WW-01 LIFT STATION #9 REPLACEMENT

SECTION 00 31 00
SCHEDULE OF UNIT PRICES
CITY OF HOLLY HILL

LIFT STATION #9 REPLACEMENT
BID NO. 20-WW-01

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
A.	PRELIMINARY ITEMS				
1	Mobilization	1	LS	40,465.95	40,465.95
2	Erosion and Sediment Control	1	LS	4,050.00	4,050.00
3	Preconstruction Video	1	LS	1,350.00	1,350.00
4	Field Locate and Expose Existing Utilities	1	LS	1,350.00	1,350.00
B.	LIFT STATION				
1	Bypass Pumping	1	LS	10,530.00	10,530.00
2	Demolition	1	LS	22,950.00	22,950.00
3	Complete Lift Station	1	LS	129,118.80	129,118.80
4	Electrical	1	LS	18,798.75	18,798.75
5	Gate Valve - 6" RS	1	EA	1,012.50	1,012.50
6	Force Main - 6" C900 PVC w/fittings	10	LF	67.50	675.00
7	Tie-Ins				
	a) Tie-In to Existing Force Main	1	LS	3,375.00	3,375.00
8	DIP Fittings Add or Delete	10	LB	22.50	225.00
9	Permits and Allowances	1	LS	\$5,000	\$5,000
10	Lift Station As-Built Plans	1	LS	3,375.00	3,375.00
11	Open Cut and Repair Asphalt	10	SY	108.00	1,080.00
C.	GENERAL				
1	Concrete Pavement, Remove and Replace				
	a) 4" Thick Sidewalk	50	SY	94.50	4,725.00
	b) 6" Thick Driveway/Pavement	10	SY	108.00	1,080.00
2	Sod - Argentine Bahia	100	SY	6.75	675.00
3	Compliance with Florida "Trench Safety Act"	1	LS	1.00	1.00
4	Unsuitable Material Excavation	1	CY	40.50	40.50
5	Crushed Rock or Shell Trench Subgrade Material	1	CY	60.75	60.75
6	Rock Excavation	1	CY	60.75	60.75
BASE BID TOTAL					249,999.00

Submitted by: Cain Enterprises LLC dba Engineering Solutions International

Contractor: Fred Lane

Address: 32 NE 16th St., Ocala, FL 34470

Telephone: (352) 390-6555

Fax: _____

State of Florida Certified General Contractor or Underground Contractor (Required Information)

Licensee: Fred Lane

License No: CBC 045628
CUC 048362

SECTION 00 32 00

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The bidder may submit any additional information he desires.

- A. Name of bidder. Cain Enterprises LLC dba Engineering Solutions International
- B. Permanent main office address. 32 NE 16th St., Ocala, FL 34470
- C. When organized. 02/03/2006
- D. If a corporation, where incorporated. Florida
- E. How many years have you been engaged in the contracting business under your present firm or trade name? 14+ years
- F. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.) See Attached
- G. General character of work performed by your company. Water, Wastewater, Engineering, Construction, and Operations
- H.⁽¹⁾ Have you ever failed to complete any work awarded to you? If so, where and why? No
- H.⁽²⁾ Provide list of any lawsuits or judgments filed by or against your company in the last three years, indicating the nature and outcome.
- I. Have you ever defaulted on a contract? If so, where and why? No
- J. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed. See Attached
- K. List your major equipment __See Attached_____.
- L. Experience in construction work similar in type to this project. See Attached
- M. Background and experience of the principal members of your organization, including the officers. See Attached
- N. Credit available: \$ _2,000,000.00 (Two million Dollars)_____
- O. Give bank reference: _Mike Ciocca (Insight) 724-422-4868 April Adams (Chase) 352-598-4172
- P. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner? Yes

- Q. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at 10:30 am this 24th day of April, 2020.

Fred Lane
Name of Bidder By:

General Manager
Title

State of Florida

County of Marion

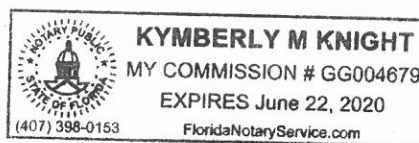
Fred Lane being duly sworn deposes and says that he is
the General Manager of Cain Enterprises LLC dba Engineering Solutions International
and that the answers to the City of Holly Hill foregoing questions
Name of Organization

and all statements therein contained are true and correct.

Subscribed and sworn to before me this 24th day of April, 2020.

Kymberly Knight
Notary Public

Kymberly Knight
Notary Public (Print or Type)



My commission expires: 6/22/2020

CAIN ENTERPRISES LLC dba
ENGINEERING SOLUTIONS INTERNATIONAL
CONSTRUCTION PERSONNEL

Fred Lane – 30+ years of experience in underground construction. Lift Stations, Water main, force main, and sewer main experience. Pressure and gravity line experience. Pipe laying, excavating, concrete experience, all aspects of construction and underground piping

Lee Cain – 20+ years of experience in underground construction. Lift Stations, Water main, force main, and sewer main experience. Pressure and gravity line experience. Pipe laying, excavating, concrete experience, all aspects of construction and underground piping

Ray McCloskey - Construction and Maintenance of water and wastewater treatment facilities including all aspects: electrical, mechanical, plumbing and structural components. Experience in underground pipe laying, machine operator, excavating, pressure and gravity lines, and concrete work.

Mark Champion - Construction and Maintenance of water and wastewater treatment facilities including all aspects: electrical, mechanical, plumbing and structural components. Experience in underground pipe laying, machine operator, excavating, pressure and gravity lines, and concrete work.

Airon Bolland – Construction experience including but not limited to: ditch digging, pipe laying, concrete work, underground water, sewer and force mains, water and waste water plant repair and maintenance.

Steve Moore – Construction experience including but not limited to: ditch digging, pipe laying, concrete work, underground water, sewer and force mains, water and waste water plant repair and maintenance.

Bill Satter - Construction experience including but not limited to: Machine operator, ditch digging, pipe laying, concrete work, underground water, sewer and force mains, pressure and gravity and manhole setting

Dalton Marsh - Construction experience including but not limited to: Machine operator, ditch digging, pipe laying, concrete work, underground water, sewer and force mains, pressure and gravity and manhole setting

- Construction crew experienced in running all ESI equipment.

EQUIPMENT OF CAIN ENTERPRISES LLC dba
ENGINEERING SOLUTIONS INTERNATIONAL

Five (5) Fleet Trucks
Three (3) Crane Trucks
Two (2) Mini Excavators
One (1) Skid Steer
Five (5) Mud Hawg
Four Inch (4") Double Diaphragm Pump
Vac Trailer
Plate Tampers
Jack hammers
Eight (8) Cut saws
Four (4) Generators
Light Towers
Five (5) Welders
Pressure Washer
Three (3) Trash Pumps
Covered and Uncovered Trailers
Two (2) survey transits
Two (2) Air compressors
Winch

* Open availability for any additional equipment that may be needed through several different companies at our disposal

SECTION 00 33 00
LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. Upon approval of subcontractors listed the successful bidder shall not substitute subcontractors without approval from the Engineer. Bidder shall attach additional sheets as necessary.

SUBCONTRACTOR	COMPANY NAME	REFERENCES
PCI Raven (352) 383-0194	PCI Raven 1222 Camp Ave. Int. Dora, FL 32757	1) 2) 3)
Mack Concrete (352) 742-2333	Mack Concrete PO 157 Astatula, FL 34705	1) 2) 3)
Cullum Land Surveying (386) 761-7666	Cullum Land Surveying 5889 S Williamson Suite 205 Blvd Port Orange, FL 32128	1) 2) 3)
		1) 2) 3)

END OF SECTION

SECTION 00 33 10
LISTING OF PREVIOUS EXPERIENCE

The bidder proposes that he/she is qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. A minimum of three (3) projects must be listed below. The Owner reserves the right to check references and confirm information provided herein.

See attached

NO.	PROJECT	OWNER	DESCRIPTION/COST	REFERENCE	DATE WORK STARTED & FINISHED MM/YR TO MM/YR
1					
2					
3					

END OF SECTION

CAIN ENTERPRISES LLC dba
ENGINEERING SOLUTIONS INTERNATIONAL
EXPERIENCE

- Holly Hill - WW Valve replacement at LS #19, #20, #21, and #24.
- Sparton - Construct new WWTP, all piping, concrete, trenching, installation of pumps and motors.
- Crestwood - Replacement of 24,000 linear feet of water main in existing subdivision including 6", 8", 10" and 12" piping.
Subcontracted from Oxford Pipeline, Craig Barrette (Owner) For reference please call and email (352) 504-8750 or cbarrette@oxfordpipeline.com
- Grand Oaks - Placement of 1500 linear feet of 2" water main, 1500 linear feet of 6" gravity sewer main, and 300 linear feet of force main. Subcontracted from Oxford Pipeline, Craig Barrette (Owner) For reference please call and email (352) 504-8750 or cbarrette@oxfordpipeline.com
- Dixie Groves - Replacement of 14,900 linear feet of 4" PVC water main in existing subdivision. Subcontracted from Oxford Pipeline, Craig Barrette (Owner) For reference please call and email (352) 504-8750 or cbarrette@oxfordpipeline.com

**SECTION 00 41 00
BID BOND**

Cain Enterprises, LLC dba Engineering Solutions International

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as Principal and
FCCI Insurance Company of the City of Sarasota State of FL, a corporation
existing under the laws of the State of Florida, as Surety, are held and firmly bound unto the
The City of Holly Hill hereinafter called the Owner, in the sum of
FIVE percent of amount bid Dollars (\$ 5%)
lawful money of the United States of America, for the payment of which sum well and truly to be
made, we bind ourselves our heirs, executors, administrators and successors, jointly and severally,
firmly by these presents.

The condition of this obligation is such that whereas the Principal has submitted the accompanying
Proposal or Bid, for the construction of:

LIFT STATION #9 REPLACEMENT

NOW, THEREFORE, if the Principal shall not withdraw said Bid within ninety (90) days after the
opening of the same and in the event of the acceptance of his proposal by the Owner, shall, within
the period specified therefore, enter into a written contract with the Owner in accordance with the
Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for
the faithful performance and proper fulfillment of such contract, or in the event of the withdrawal
of said Bid within the period specified, of the failure to enter into such contract and give bonds
within the time specified, if the Principal shall pay the Owner the difference between the amount
specified in said Bid and the amount for which the Owner may procure the required work, if the
latter amount be in excess of the former, then the above obligation shall be void and of no effect,
otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this 28th day of April, 2020 the name and corporate seal of each corporate body being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

IN PRESENCE OF:

_____(Seal)

_____(Seal)

_____(Seal)

Individual or Partner

Witness

Address

Cain Enterprises, LLC dba Engineering Solutions International

Corporate Principal

ATTEST:

[Signature]

[Signature]
Fred Lane - General Manager
President AFFIX
CORPORATE SEAL

32 NE 16th St.

Ocala, FL 34470

Address

By

AFFIX
CORPORATE SEAL

FCCI Insurance Company

Corporate Surety

ATTEST:

[Signature]

[Signature]
Benjamin H. French, Attorney-in-Fact & FL Resident Agent

END OF SECTION

**SECTION 00 41 00
BID BOND**

Cain Enterprises, LLC dba Engineering Solutions International

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as Principal and
FCCI Insurance Company of the City of Sarasota State of FL, a corporation

existing under the laws of the State of Florida, as Surety, are held and firmly bound unto the
The City of Holly Hill hereinafter called the Owner, in the sum of
FIVE percent of amount bid Dollars (\$ 5%)

lawful money of the United States of America, for the payment of which sum well and truly to be
made, we bind ourselves our heirs, executors, administrators and successors, jointly and severally,
firmly by these presents.

The condition of this obligation is such that whereas the Principal has submitted the accompanying
Proposal or Bid, for the construction of:

LIFT STATION #9 REPLACEMENT

NOW, THEREFORE, if the Principal shall not withdraw said Bid within ninety (90) days after the
opening of the same and in the event of the acceptance of his proposal by the Owner, shall, within
the period specified therefore, enter into a written contract with the Owner in accordance with the
Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for
the faithful performance and proper fulfillment of such contract, or in the event of the withdrawal
of said Bid within the period specified, of the failure to enter into such contract and give bonds
within the time specified, if the Principal shall pay the Owner the difference between the amount
specified in said Bid and the amount for which the Owner may procure the required work, if the
latter amount be in excess of the former, then the above obligation shall be void and of no effect,
otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this 28th day of April, 2020 the name and corporate seal of each corporate body being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

IN PRESENCE OF:

_____(Seal)

_____(Seal)

_____(Seal)
Individual or Partner

Witness

Address

Cain Enterprises, LLC dba Engineering Solutions International

ATTEST:

[Signature]

[Signature] Corporate Principal
Fred Lane - General Manager
President AFFIX
CORPORATE SEAL

32 NE 16th St.
Ocala, FL 34470
Address

By _____
AFFIX
CORPORATE SEAL

FCCI Insurance Company
Corporate Surety

ATTEST:

[Signature]

[Signature]
Benjamin H. French Title Attorney-in-Fact & FL Resident Agent

END OF SECTION



GENERAL POWER OF ATTORNEY

Know all men by these presents: That the FCCI Insurance Company, a Corporation organized and existing under the laws of the State of Florida (the "Corporation") does make, constitute and appoint:

L Dale Waldorff; Pamela L Jarman; Benjamin H French; Paul A Locascio; Rebekah G Wolf; K Wayne Walker

Each, its true and lawful Attorney-In-Fact, to make, execute, seal and deliver, for and on its behalf as surety, and as its act and deed in all bonds and undertakings provided that no bond or undertaking or contract of suretyship executed under this authority shall exceed the sum of (not to exceed \$10,000,000.00): \$10,000,000.00

This Power of Attorney is made and executed by authority of a Resolution adopted by the Board of Directors. That resolution also authorized any further action by the officers of the Company necessary to effect such transaction.

The signatures below and the seal of the Corporation may be affixed by facsimile, and any such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached.

In witness whereof, the FCCI Insurance Company has caused these presents to be signed by its duly authorized officers and its corporate seal to be hereunto affixed, this 31st day of January, 2019.

Attest:

Craig Johnson

Craig Johnson, President
FCCI Insurance Company



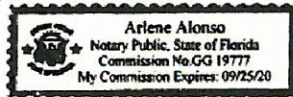
Cina Welch

Cina Welch, EVP, General Counsel,
Chief Audit & Compliance Officer, Secretary
FCCI Insurance Company

State of Florida
County of Sarasota

Before me this day personally appeared Craig Johnson, who is personally known to me and who executed the foregoing document for the purposes expressed therein.

My commission expires: 9/25/2020



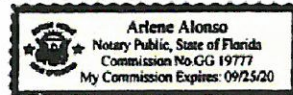
Arlene Alonso

Notary Public

State of Florida
County of Sarasota

Before me this day personally appeared Cina Welch, who is personally known to me and who executed the foregoing document for the purposes expressed therein.

My commission expires: 9/25/2020



Arlene Alonso

Notary Public

CERTIFICATE

I, the undersigned Secretary of FCCI Insurance Company, a Florida Corporation, DO HEREBY CERTIFY that the foregoing Power of Attorney remains in full force and has not been revoked; and furthermore that the February 24, 2011 Resolution of the Board of Directors, referenced in said Power of Attorney, is now in force.

Dated this 28th day of April, 2020

Cina Welch

Cina Welch, EVP, General Counsel,
Chief Audit & Compliance Officer, Secretary

SECTION 00 47 00

SWORN STATEMENT UNDER SECTION 287.133(3)(a), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES:

This sworn statement is submitted with Bid, Proposal **or** Contract No. 20-WW-01 for City of Holly Hill - Lift Station #9 Replacement.

This sworn statement is submitted by Cain Enterprises LLC dba Engineering Solutions International whose business address is 32 NE 16th St., Ocala, FL 34470 and (if applicable) its Federal Employer Identification Number (FEIN) is 56-2558251. (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)

My name is Fred Lane any my relationship to the entity named above is General Manager.

I understand that a "public entity crime" as defined in Paragraph 287.133(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

I understand that "convicted" or "conviction" as defined in Paragraph 287.133(i)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

I understand that an "affiliate" as defined in Paragraph **287.133(l)(a)**, Florida Statutes, means:

1. A predecessor or successor of a person convicted of a public entity crime: or
2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie that one person controls another person. A person who knowingly enters into a joint venture with a

person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

I understand that a "person" as defined in Paragraph 287.133(i)(e), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies).

☒ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

☐ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND (Please indicate which additional statement applies.)

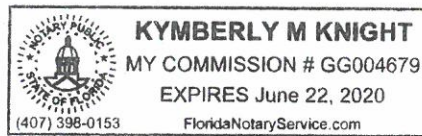
☐ There has been a proceeding concerning the conviction before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

☐ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

(Signature) _____ Date: 4-27-2020

State of Florida County of Marion

PERSONALLY APPEARED BEFORE ME, the undersigned authority, Fred Lane
who, after first being sworn by me, affixed his/her signature in the space provided above on
this 24th day of April, 2020.



Kymberly M Knight
Notary Public: Kymberly Knight

My Commission Expires: June 20, 2020

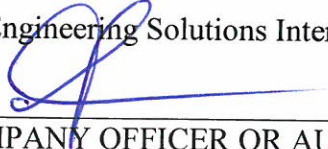
SECTION 00 48 00
ANTI-COLLUSION STATEMENT

By signing this form, the bidder agrees that this is made without any other understanding, agreement, or connection with any person, corporation, or firm submitting a proposal for the same purpose and that the proposal is in all respects fair and without collusion or fraud.

SIGN in ink in the space provided below. Unsigned bids will be considered incomplete, and will be disqualified, and rejected.

IT IS AGREED BY THE UNDERSIGNED BIDDER THAT THE SIGNING AND DELIVERY OF THE BID REPRESENTS THE BIDDER'S ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE FORGOING SPECIFICATIONS, CONTRACT AND PROVISIONS, AND IF AWARDED, THIS CONTRACT WILL REPRESENT THE AGREEMENT BETWEEN EACH OF THE GOVERNMENTAL PARTIES.

NAME OF FIRM: Cain Enterprises LLC dba Engineering Solutions International

SIGNED BY: 
(MUST BE SIGNED BY A COMPANY OFFICER OR AUTHORIZED AGENT)

TITLE: General Manager

ADDRESS: 32 NE 16th St

CITY AND STATE: Ocala, FL 34470

TELEPHONE: (352) 390-6555

COMPLETION TIME: 150 days substantial completion then 30 days to final completion

NO proposals will be withdrawn for a period of ninety (90) days subsequent to the opening of the proposals, without the consent of the City of Holly Hill.

NO BID (REASON) _____

END OF SECTION

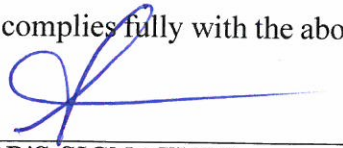
**SECTION 00 48 50
DRUG FREE/TIE PREFERENCE STATEMENT**

In the event of a tie bid a preference is given to vendors submitting a certification with their bid/proposal certifying they have a drug-free workplace in accordance with Section 287.087, Florida Statutes. This requirement affects all public entities of the State and becomes effective January 1, 1991. The special conditions are as follow:

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the State or by any political subdivision for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction or, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfaction participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.



VENDOR'S SIGNATURE

END OF SECTION

**SECTION 00 49 00
TRENCH SAFETY AFFIDAVIT**

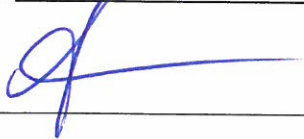
Trench excavations on this Project are expected to be in excess of 5 feet deep. The Occupational Safety and Health Administration excavation safety standards, 29 CFR 1926.650 Subpart P trench safety standards will be in effect during the period of construction of the Project.

Bidder acknowledges that included in the Bid Price are costs for complying with the Florida Trench Safety Act (90-096, Laws of FL) effective October 1, 1990, and hereby gives assurance that, if awarded the Contract, the Contractor or Subcontractor performing trench excavation work on the Project will comply with the applicable trench safety standards. The Bidder further identifies the costs as follows:

<u>Trench Safety Item (Description)</u>	<u>Cost</u>
Sloping	\$1.00
One dollar	
(Cost in Words)	
TOTAL \$	1.00

FAILURE TO COMPLETE THE ABOVE SHALL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE

COMPANY NAME: Cain Enterprises LLC dba
Engineering Solutions International

DATE: April 27, 2020 BY: 

(Additional sheets shall be attached, as needed and, items shall be organized to correspond with the bid format)

SECTION 00 62 00
CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Frederick Lane, certify that I am the Managing Partner of the corporation named as Principal in the within Bid Bond; that Frederick Lane who signed the said Bid Bond on behalf of the Principal was then Managing Partner of said corporation; that I know his signature, and his signature thereto is genuine; and that said Bid Bond was duly signed, sealed and attested for in behalf of said corporation by authority of its governing body.



Fred Lane - General Manager
Signature

Cain Enterprises LLC dba
Engineering Solutions International
AFFIX CORPORATE SEAL

END OF SECTION

SECTION 00 48 60

COMPLIANCE WITH THE PUBLIC RECORDS LAW

Project Number: ITB # 20-WW-01

Upon award recommendation or ten (10) days after opening, submittals become "public records" and shall be subject to public disclosure consistent with Chapter 119, Florida Statutes. Proposers must invoke the exemptions to disclosure provided by law in the response to the solicitation, and must identify the data or other materials to be protected, and must state the reasons why such exclusion from public disclosure is necessary. The submission of a proposal authorizes release of your firm's credit data to the CITY.

If the company submits information exempt from public disclosure, the company must identify with specificity which pages/paragraphs of their bid/proposal package are exempt from the Public Records Act, identifying the specific exemption section that applies to each. The protected information must be submitted to the CITY in a separate envelope marked accordingly.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT

Valerie Manning, City Clerk

386-248-9441

vmanning@hollyhillfl.org

1065 Ridgewood Ave

Holly Hill, FL 32117

A provision that requires the contractor to comply with public records laws, specifically to:

1. Keep and maintain public records required by the public agency to perform the service.
2. Upon request from the public agency's custodian of public records, provide the public agency with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in this chapter or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the records to the public agency.
4. Upon completion of the contract, transfer, at no cost, to the public agency all public records in possession of the contractor or keep and maintain public records required by the public agency to perform the service. If the contractor transfers all public records to the public agency upon completion of the contract, the contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the contractor keeps and maintains public records upon completion of the contract, the contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the public agency, upon request from the public agency's custodian of public records, in a format that is compatible with the information technology systems of the public agency.

By submitting a response to this solicitation, the company agrees to defend the CITY in the event we are forced to litigate the public records status of the company's documents.

Company Name: CAIN ENTERPRISES LLC dba Engineering Solutions International

Authorized representative (printed): Fred Lane

Authorized representative (signature): [Signature]

Date: 4-27-20

END OF SECTION

**CITY OF HOLLY HILL, FLORIDA
INSURANCE REQUIREMENTS CHECKLIST
CITY OF HOLLY HILL, VOLUSIA COUNTY, FLORIDA**

Items marked "X" must be provided

<u>X</u>	<u>General Liability</u>		Minimum Limits Required	
	<u>X</u> Commercial General Liability	\$ <u>2,000,000</u>	General Aggregate	
	<u>X</u> Occurrence Form	\$ <u>1,000,000</u>	Product/Completed Operations Agg.	
	_____	\$ <u>1,000,000</u>	Personal & Advertising Injury	
	_____	\$ <u>1,000,000</u>	Each Occurrence	
	_____	\$ <u>100,000</u>	Fire Damage Pump Stations	
<u>X</u>	<u>Automobile Liability</u>			
	Owned, Hired & Non-Owned	\$ <u>1,000,000</u>	Combined Single Limit per Occurrence	
<u>X</u>	<u>Worker's Compensation and Employer's Liability</u>		Statutory	
		\$ <u>100,000</u>	Each Accident	
		\$ <u>500,000</u>	Disease - Policy Limit	
		\$ <u>100,000</u>	Disease - Each Employee	
_____	<u>Professional Liability - Errors & Omissions</u> (*To be completed by Bidder)			
	* Deductible: \$ _____	\$ _____	Aggregate	
	* Claims Made (Y/N): _____	\$ _____	Each Claim	
	* Occurrence (Y/N): _____			
	* Defense included in Limits (Y/N): _____			
<u>X</u>	<u>Builder's Risk/Installation Floater</u> (*To be completed by Bidder)			
	* Flood included \$ _____ Limit	\$ _____	100% of Completed or Installed Value, All-Risk Form	
	* Transportation included \$ _____ Limit			
	* Storage included \$ _____ Limit			
	City must be a named insured. Copy of policy will be required.			
_____	<u>Other</u>			
	_____	\$ _____		
	_____	\$ _____		

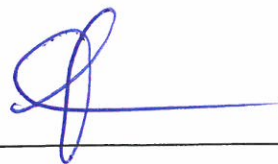
- X The Certificate of Insurance must show "The City of HOLLY HILL, elected officials and employees" and the adjacent property owners as an additional insured.
- X Certificates must give to the City of HOLLY HILL 30 days' prior written notice of cancellation, non-renewal, or adverse change.
- X Certificates must identify bid number and bid title.
- X A Wavier of Subrogation shall be provided to the City

Statement of Bidder:

We understand the requirements requested and agree to comply fully.

Bidder - Authorized Signature

A complete copy of this form with original signature must accompany bid.



 Fred Lane - General Manager
 4-27-2020



CERTIFICATE OF LIABILITY INSURANCE

DATE (7.1.d)
3/26/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Commercial Lines - USI Insurance Services LLC 2601 South Bayshore Drive, Suite 1600 Coconut Grove, FL 33133	CONTACT NAME: Risk Management Department PHONE (A/C, No, Ext): (866) 443-8489 E-MAIL ADDRESS: Work.Comp@Trinet.com FAX (A/C, No): (800) 889-0021
INSURED TriNet HR III, Inc. RE: Cain Enterprises, LLC DBA Engineering Solutions Intern 9000 Town Center Parkway Bradenton, FL 34202	INSURER(S) AFFORDING COVERAGE INSURER A: Indemnity Insurance Company of North America INSURER B: INSURER C: INSURER D: INSURER E: INSURER F:

COVERAGES **CERTIFICATE NUMBER:** 14908421 **REVISION NUMBER:** See below

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☐ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC OTHER:						EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ OWNED AUTOS ONLY ☐ HIRED AUTOS ONLY ☐ SCHEDULED AUTOS ☐ NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)
	UMBRELLA LIAB EXCESS LIAB ☐ OCCUR ☐ CLAIMS-MADE DED RETENTION \$						EACH OCCURRENCE AGGREGATE
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	N/A	X WLR_C66084139	7/1/2019	7/1/2020	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT
							\$ 2,000,000 \$ 2,000,000 \$ 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Bid/Project # 20-WW-01 .

Workers' Compensation coverage is limited to worksite employees of Cain Enterprises, LLC a co-employment agreement with TriNet HR III, Inc.

CERTIFICATE HOLDER City of Holly Hill 1065 Ridgewood Avenue Holly Hill, FL 32117	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
--	---

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ACORD 25 (2016/03)

(This certificate replaces certificate# 14343937 issued on 6/25/2019)

Packet Pg. 542

Attachment: Holly Hill Lift Station #9 Replacement 20-WW-01-Cain dba ESI (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award

Workers' Compensation and Employers' Liability Policy

Named Insured TriNet HR III, Inc. RE: Cain Enterprises, LLC DBA Engineering Solutions Intern	Endorsement Number Policy Number WLR_C66084139 Symbol: Number: Effective Date of Endorsement 07-01-2019
Policy Period 7/1/2019 TO 7/1/2020	Issued By (Name of Insurance Company) Indemnity Insurance Company of North America
Insert the policy number. The remainder of the information is to be completed only when this endorsement is issued subsequent to the preparation of the policy.	

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.

This agreement shall not operate directly or indirectly to benefit any one not named in the Schedule.

Schedule

City of Holly Hill
 1065 Ridgewood Avenue
 Holly Hill, FL 32117

Bid/Project # 20-WW-01

For the states of CA, TX, refer to state specific endorsements.

This endorsement is not applicable in KY, NH, and NJ.



Authorized Agent



CERTIFICATE OF LIABILITY INSURANCE

DATE **7.1.d**
03/26/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Bird Insurance Services 516 SE 17th St Ocala FL 34471		CONTACT NAME: Cindy Williams PHONE (A/C, No, Ext): (352) 622-3899 E-MAIL ADDRESS: cwilliams@birdinsagency.com FAX (A/C, No): (352) 622-5854	
INSURED Cain Enterprises, LLC dba Engineering Solutions International 32 NE 16th Street Ocala FL 34470-4109		INSURER(S) AFFORDING COVERAGE INSURER A: Colony Insurance Company INSURER B: Auto-Owners Insurance Company INSURER C: INSURER D: INSURER E: INSURER F:	
		NAIC # 39993 18988	

COVERAGES **CERTIFICATE NUMBER:** 19-20 Auto/20-21 GL **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR	Y	Y	PACEP304634	03/06/2020	03/06/2021	EACH OCCURRENCE \$ 1,000,000
	DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000						
	MED EXP (Any one person) \$ 10,000						
	PERSONAL & ADV INJURY \$ 1,000,000						
GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☒ PROJECT ☐ LOC OTHER:							GENERAL AGGREGATE \$ 2,000,000
							PRODUCTS - COMP/OP AGG \$ 2,000,000
B	☒ AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ OWNED AUTOS ONLY ☐ HIRED AUTOS ONLY ☐ SCHEDULED AUTOS ☐ NON-OWNED AUTOS ONLY	Y	Y	4872525402	09/25/2019	09/25/2020	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000
	BODILY INJURY (Per person) \$						
	BODILY INJURY (Per accident) \$						
	PROPERTY DAMAGE (Per accident) \$						
							Non-owned \$
	☐ UMBRELLA LIAB ☐ EXCESS LIAB ☐ DED ☐ RETENTION \$						EACH OCCURRENCE \$
	☐ OCCUR ☐ CLAIMS-MADE						AGGREGATE \$
							\$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		PACEP304634	03/06/2020	03/06/2021	PER STATUTE ☐ OTH-ER ☐
	E.L. EACH ACCIDENT \$						
	E.L. DISEASE - EA EMPLOYEE \$						
	E.L. DISEASE - POLICY LIMIT \$						
	Professional Liability Pollution Liability						Occurrence 1,000,000
							Occurrence 1,000,000
							Agg shared w/GL agg. 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Bid/Project #20-WW-01

Please see attached.

CERTIFICATE HOLDER

CANCELLATION

City of Holly Hill
1065 Ridgewood Avenue

Holly Hill

FL 32117

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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AGENCY CUSTOMER ID: 00028659

LOC #: _____



ADDITIONAL REMARKS SCHEDULE

Page _____ of _____

AGENCY Bird Insurance Services		NAMED INSURED Engineering Solutions	
POLICY NUMBER 		EFFECTIVE DATE: 	
CARRIER 	NAIC CODE 		

ADDITIONAL REMARKS
THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: 25 **FORM TITLE:** Certificate of Liability Insurance: Notes

City of Holly Hill, elected officials and employees, and the adjacent property owners, are Additional Insureds with respect to General Liability and Automobile Liability, per written contract. Waiver of Subrogation applies in favor of City of Holly Hill, elected officials and employees, and the adjacent property owners with regards to General Liability and Automobile Liability. City of Holly Hill will be provided 30 days written notice of cancellation or non-renewal, except for 10 days notice for non-payment.

Attachment: Holly Hill Lift Station #9 Replacement 20-WW-01-Cain dba ESI (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

► Go to www.irs.gov/FormW9 for instructions and the latest information.

Give Form to the
requester. Do not
send to the IRS.

Print or type.
See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Cain Enterprises LLC

2 Business name/disregarded entity name, if different from above

Engineering Solutions International

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☒ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ► **_____**
Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ► **_____**

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) **_____**

Exemption from FATCA reporting code (if any) **_____**

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

32 NE 16th St

6 City, state, and ZIP code

Ocala, FL 34470

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

_____ - _____ - _____

or

Employer identification number

56 - 2558251

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign
Here

Signature of
U.S. person ►

Date ►

1/2/2020

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-DIV (dividends, including those from stocks or mutual funds)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.



May 1, 2020

Antoine Khoury, PE
City Engineer/Public Works Director
City of Holly Hill
453 LPGA Blvd
Holly Hill, FL 32117

Email: akhoury@hollyhillfl.org

**RE: CITY OF HOLLY HILL
LIFT STATION #9 REHABILITATION
BID NO. RFQ 20-WW-01
RECOMMENDATION OF AWARD**

Dear Antoine,

The City received nine (9) bids on the above referenced project which were opened on April 28, 2020. The apparent low bidder was Cain Enterprises dba Engineering Solutions International (ESI) of Ocala, Florida with a total bid of \$249,999.00. The second and third low bidders were Petticoat-Schmitt Civil Contractors, Inc. of Jacksonville, Florida and Danus Utilities, Inc. of Sanford, Florida with bids of \$250,690.00 and \$257,816.00, respectively (see attached bid tabulation).

After review of the bid documents, ESI's submittal was found to be complete and responsive. However, the project experience page included projects that were not similar in nature to the subject project. We spoke with Fred Lane of ESI and he provided other projects that are similar(attached). He apologized for the mis-step on the submittal.

Our firm has had recent experience with ESI working for Holly Hill. The recently completed Flamingo and Lakewood Drives Water Main Replacement and the lift station valve replacement projects both were completed with satisfactory results. We spoke with Alex Ulin of the Volusia County School Board to check ESI's work on their project. Mr. Ulin was very complimentary of ESI. They are on a 5 year contract with the school board and are performing lift station rehabilitations for them.

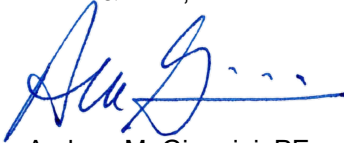
With the above, we can state that ESI appears to be qualified to perform the work on the subject project and we recommend the City award it to ESI for the total amount of \$249,999.00.

Attachment: Recommendation of Award 4.30.20 (1) (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WW02)

Antoine Khoury , PE
May 1, 2020
Page 2

We trust this is sufficient to allow the City's evaluation committee to make a decision. If there are questions, please contact our office.

Respectfully,
Mead & Hunt, Inc.



Andrew M. Giannini, PE
Associate/Senior Project Manager

AMG:bf

Attachment: Bid Tabulation
References/Experience

Attachment: Recommendation of Award 4.30.20 (1) (2020-R-21 : Lift Station #9 Rehabilitation Recommendation of Award 20WWW02)

CITY OF HOLLY HILL
LIFT STATION #9 REPLACEMENT
BID NO. 20-WW-01
BID TABULATION
April 28, 2020

				CAIN ENTERPRISES LLC DBA ENGINEERING SOLUTIONS INTERNATIONAL Ocala, FL		PETTICOAT-SCHMITT CIVIL CONTRACTORS, INC. Jacksonville, FL		DANUS UTILITIES, INC. Sanford, FL		HINTERLAND GROUP, INC. Riviera Beach, FL		BLACK SANDS DEVELOPMENT GROUP, PLLC Daytona Beach, FL		SANPIK INCORPORATED Lake Mary, FL		INTERCOUNTY ENGINEERING, INC. Pompano Beach, FL		PRIME CONSTRUCTION GROUP, INC. Orlando, FL		U.S. WATER SERVICES CORPORATION New Port Richey, FL	
ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL
A.	PRELIMINARY ITEMS																				
1	Mobilization	1	LS	\$40,465.95	40,465.95	\$1,413.00	\$1,413.00	\$25,000.00	\$25,000.00	\$4,500.00	\$4,500.00	\$7,550.00	\$7,550.00	\$30,000.00	\$30,000.00	\$25,000.00	\$25,000.00	\$30,000.00	\$30,000.00	\$2,873.00	\$2,873.00
2	Erosion and Sediment Control	1	LS	\$4,050.00	\$4,050.00	\$1,000.00	\$1,000.00	\$2,240.00	\$2,240.00	\$2,000.00	\$2,000.00	\$5,700.00	\$5,700.00	\$15,000.00	\$15,000.00	\$3,770.00	\$3,770.00	\$6,000.00	\$6,000.00	\$3,928.00	\$3,928.00
3	Preconstruction Video	1	LS	\$1,350.00	\$1,350.00	\$1,150.00	\$1,150.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,975.00	\$1,975.00	\$330.00	\$330.00	\$2,250.00	\$2,250.00	\$1,500.00	\$1,500.00	\$373.00	\$373.00
4	Field Locate and Expose Existing Utilities	1	LS	\$1,350.00	\$1,350.00	\$2,100.00	\$2,100.00	\$2,500.00	\$2,500.00	\$1,000.00	\$1,000.00	\$8,800.00	\$8,800.00	\$3,500.00	\$3,500.00	\$10,000.00	\$10,000.00	\$4,000.00	\$4,000.00	\$1,601.00	\$1,601.00
B.	LIFT STATION																				
1	Bypass Pumping	1	LS	\$10,530.00	\$10,530.00	\$33,000.00	\$33,000.00	\$4,600.00	\$4,600.00	\$15,000.00	\$15,000.00	\$65,492.60	\$65,492.60	\$17,000.00	\$17,000.00	\$32,400.00	\$32,400.00	\$40,000.00	\$40,000.00	\$23,353.00	\$23,353.00
2	Demolition	1	LS	\$22,950.00	\$22,950.00	\$10,000.00	\$10,000.00	\$4,950.00	\$4,950.00	\$35,000.00	\$35,000.00	\$38,000.00	\$38,000.00	\$30,000.00	\$30,000.00	\$18,620.00	\$18,620.00	\$22,000.00	\$22,000.00	\$65,553.00	\$65,553.00
3	Complete Lift Station	1	LS	\$129,118.80	\$129,118.80	\$156,300.00	\$156,300.00	\$143,937.00	\$143,937.00	\$110,000.00	\$110,000.00	\$135,596.38	\$135,596.38	\$169,000.00	\$169,000.00	\$177,000.00	\$177,000.00	\$200,000.00	\$200,000.00	\$220,550.00	\$220,550.00
4	Electrical	1	LS	\$18,798.75	\$18,798.75	\$20,200.00	\$20,200.00	\$40,420.00	\$40,420.00	\$85,000.00	\$85,000.00	\$21,000.00	\$21,000.00	\$44,000.00	\$44,000.00	\$22,600.00	\$22,600.00	\$45,000.00	\$45,000.00	\$39,366.00	\$39,366.00
5	Gate Valve - 6" RS	1	EA	\$1,012.50	\$1,012.50	\$1,550.00	\$1,550.00	\$2,200.00	\$2,200.00	\$3,500.00	\$3,500.00	\$2,177.00	\$2,177.00	\$1,500.00	\$1,500.00	\$3,000.00	\$3,000.00	\$1,500.00	\$1,500.00	\$1,273.00	\$1,273.00
6	Force Main - 6" C900 PVC w/fittings	10	LF	\$67.50	\$675.00	\$320.00	\$3,200.00	\$266.00	\$2,660.00	\$200.00	\$2,000.00	\$203.50	\$2,035.00	\$425.00	\$4,250.00	\$657.00	\$6,570.00	\$1,000.00	\$10,000.00	\$226.00	\$2,260.00
7	Tie-Ins																				
	a) Tie-In to Existing Force Main	1	LS	\$3,375.00	\$3,375.00	\$4,500.00	\$4,500.00	\$5,689.00	\$5,689.00	\$5,000.00	\$5,000.00	\$9,997.00	\$9,997.00	\$3,600.00	\$3,600.00	\$16,700.00	\$16,700.00	\$3,000.00	\$3,000.00	\$4,034.00	\$4,034.00
8	DIP Fittings Add or Delete	10	LB	\$22.50	\$225.00	\$45.00	\$450.00	\$11.00	\$110.00	\$15.00	\$150.00	\$150.00	\$1,500.00	\$5.00	\$50.00	\$165.00	\$1,650.00	\$1,000.00	\$10,000.00	\$243.00	\$2,430.00
9	Permits and Allowances	1	LS	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00
10	Lift Station As-Built Plans	1	LS	\$3,375.00	\$3,375.00	\$500.00	\$500.00	\$4,400.00	\$4,400.00	\$4,500.00	\$4,500.00	\$1,800.00	\$1,800.00	\$5,000.00	\$5,000.00	\$6,000.00	\$6,000.00	\$2,000.00	\$2,000.00	\$5,958.00	\$5,958.00
11	Open Cut and Repair Asphalt	10	SY	\$108.00	\$1,080.00	\$425.00	\$4,250.00	\$175.00	\$1,750.00	\$400.00	\$4,000.00	\$450.00	\$4,500.00	\$75.00	\$750.00	\$160.00	\$1,600.00	\$300.00	\$3,000.00	\$156.00	\$1,560.00
C.	GENERAL																				
1	Concrete Pavement, Remove and Replace																				
	a) 4" Thick Sidewalk	50	SY	\$94.50	\$4,725.00	\$11.00	\$550.00	\$45.00	\$2,250.00	\$60.00	\$3,000.00	\$7.50	\$375.00	\$65.00	\$3,250.00	\$145.00	\$7,250.00	\$30.00	\$1,500.00	\$101.00	\$5,050.00
	b) 6" Thick Driveway/Pavement	10	SY	\$108.00	\$1,080.00	\$28.00	\$280.00	\$181.00	\$1,810.00	\$70.00	\$700.00	\$45.00	\$450.00	\$70.00	\$700.00	\$230.00	\$2,300.00	\$50.00	\$500.00	\$288.00	\$2,880.00
2	Sod - Argentine Bahia	100	SY	\$6.75	\$675.00	\$43.00	\$4,300.00	\$15.00	\$1,500.00	\$8.00	\$800.00	\$32.25	\$3,225.00	\$7.00	\$700.00	\$25.00	\$2,500.00	\$4.00	\$400.00	\$8.00	\$800.00
3	Compliance with Florida "Trench Safety Act"	1	LS	\$1.00	\$1.00	\$700.00	\$700.00	\$1,000.00	\$1,000.00	\$500.00	\$500.00	\$3,700.00	\$3,700.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$2,000.00	\$2,000.00	\$2.00	\$2.00
4	Unsuitable Material Excavation	1	CY	\$40.50	\$40.50	\$44.00	\$44.00	\$1,200.00	\$1,200.00	\$30.00	\$30.00	\$40.00	\$40.00	\$50.00	\$50.00	\$550.00	\$550.00	\$100.00	\$100.00	\$32.00	\$32.00
5	Crushed Rock or Shell Trench Subgrade Material	1	CY	\$60.75	\$60.75	\$148.00	\$148.00	\$1,350.00	\$1,350.00	\$50.00	\$50.00	\$60.00	\$60.00	\$50.00	\$50.00	\$370.00	\$370.00	\$50.00	\$50.00	\$87.00	\$87.00
6	Rock Excavation	1	CY	\$60.75	\$60.75	\$55.00	\$55.00	\$1,750.00	\$1,750.00	\$40.00	\$40.00	\$65.00	\$65.00	\$100.00	\$100.00	\$870.00	\$870.00	\$200.00	\$200.00	\$125.00	\$125.00
BASE BID TOTAL				\$249,999.00		\$250,690.00		\$257,816.00		\$283,270.00		\$319,037.98		\$334,830.00		\$347,000.00		\$387,750.00		\$389,088.00	

Note: Black Sands Development Group, LLC's bid (\$319,761.98) had an arithmetic error of \$724, which resulted in a corrected bid total of \$319,037.98, as shown above.

No.	Project	Owner	Description/Cost	Reference	Date of Work
1	Hillcrest LS Upgrade and Improvement	Lori Nasoffer	Changing out pumps, rehabing of LS Conversion from onsite to tie on with the city. Design build	Lori Nasoffer (407) 616-7757	2015-2016
2	Pilot #89 Ellenton LS Rehab	Dynamis	LS improvements changing out pumps to include bypass pumping and valve exchange	Chris Wallace (865) 253-1769	February-20
3	Pilot #91 Jacksonville LS Rehab	Dynamis	Changing out pumps, rehabing of LS to include bypass pumping, valve exchange, pipe exchange redirecting flow all while keeping system active/in service	Chris Wallace (865) 253-1769	November-17
4	Pilot #92 Ocala LS Rehab	Pilot	Rehabing of LS to change over from existing pumps, piping and wiring to new	Bill Spalding (865) 474-2220	February-18
5	Pilot #626 St Augustine LS Rehab	Dynamis	New pumps, bypass pumping, valve exchange, pipe exchange for manhole collapse	Chris Wallace (865) 253-1769	November-17
6	Sunrise Arc LS New Install	Oxford Pipeline	Installing new LS for new community including pumps, piping and excavation	Craig Barrette 352/330-0387 Office 352/504-8750 Cell	July-18
7	4400 19A Mt Dora LS New Install	Oxford Pipeline	Pumps, valves, and excavation for new installation	Craig Barrette 352/330-0387 Office 352/504-8750 Cell	January-18
8	Seco Retrofit and Rehab LS while live	Oxford Pipeline	Rehabing of LS to include new pumps, bypass pumping, valve exchange, pipe exchange redirecting flow all while keeping system active/in service	Craig Barrette 352/330-0387 Office 352/504-8750 Cell	June-19
9	McInnis Elementary LS Rehab	Volusia County Schools	Retrofit new pipes, pumps and valves for existing LS	Alex Ulin (386) 947-8786 Cell (386) 527-6105	March-20
10	Spruce Creek High LS Rehab	Volusia County Schools	Valve exchange, pipe exchange redirecting flow all while keeping system active/in service to rehab the existing LS at High School	Alex Ulin (386) 947-8786 Cell (386) 527-6105	April-20
11	Sparton Abandon existing LS and design build new LS and WWTP	Sparton DeLeon Springs	Abandon old LS and replace with new LS and WWTP. Including but not limited to all piping, pumps, concrete, engineering and keeping old LS active until complete	Dan Drew (386) 740-5414 (386) 523-6459	November 2019 - May 2020
12	Caddy Shack LS Rehab	Streamsong Resort	Changing out pumps, rehabing of LS to include bypass pumping, valve exchange, pipe exchange redirecting flow all while keeping system active/in service	Ron Thompspon Cell (813) 347-8510	March-19
13	Black Comfort Station LS Rehab	Streamsong Resort	Retrofitting the existing LS pumps and valves	Ron Thompspon Cell (813) 347-8510	December-18
14	Club House LS Rehab	Streamsong Resort	Rehabbing the old LS to become compliant with all new rules and regulations of DEP, including piping, pumps while keeping system active/in service	Ron Thompspon Cell (813) 347-8510	August-19
15	Lift Station Rehab Town & Country MHP	Town & Country MHP	LS improvements to comply with DEP regulations. Including new pumps and piping.	Wayne Garber (407) 701-9104	April-19
16	CFBC	CFBC	New LS replacing current LS onsite. Replacing vales, pumps, pipes and keeping system working while completing the project	Rob Brackett (561) 310-5041	May-17



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Resolution**

7.2

MEETING DATE: May 12, 2020
FROM: Antoine Khoury
SUBJECT: A Resolution of the City Commission of the City of Holly Hill, Florida, Adopting the Updated Volusia County Local Mitigation Strategy; and Providing for Severability; and Providing for an Effective Date.
NUMBER: 2020-R-22
APPLICANT:
PLANNER:

DISCUSSION:

The Volusia County Local Mitigation Strategy is a working group which has established a comprehensive, coordinated planning process involving the County and its municipalities. The LMS, represented by staff throughout municipalities of the County, have identified, justified and prioritized a number of programs needed to mitigate the vulnerabilities as identified by municipalities. The Local Mitigation Strategy is attached to this agenda.

Volusia County is asking that all jurisdictions accept and approve its designated portion of the Volusia County LMS and accept and endorse the mitigation goals and objectives established by Volusia Prepares for the countywide plan.

FISCAL ANALYSIS:

None at this time.

STAFF RECOMMENDATION:

Adopt the Volusia County Local Mitigation Strategy as submitted by staff.

COMMISSION GOAL:

Goal #1: Develop and maintain a sound and sustainable financial plan for the city that establishes sufficient reserves for all funds, ensures (whenever possible) that user fees pay for services rendered, provides a realistic capital improvement program, and encourages public/private sector partnerships and intergovernmental partnerships.

Goal #4: Provide proficient public health and safety services in terms of police and fire protection, water, storm water, waste water and solid waste management and disaster

preparedness with a focus on intergovernmental collaboration, private sector partnerships, and utilization of technologies and proven innovations.

MOTION:

APPROVING AND ACCEPTING THE CITY OF HOLLY HILL'S DESIGNATED PORTIONS OF THE VOLUSIA COUNTY LOCAL MITIGATION STRATEGY PLAN AND ENDORSING THE MITIGATION GOALS AND OBJECTIVES ESTABLISHED BY VOLUSIA PREPARES FOR THE COUNTYWIDE PLAN.

ATTACHMENTS:

- Volusia County LMS 2020 Part I (PDF)
- Volusia County LMS 2020 Part II (PDF)
- Volusia County LMS 2020 Part III (PDF)

Resolution No. 2020-22**A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, ADOPTING THE UPDATED VOLUSIA COUNTY LOCAL MITIGATION STRATEGY; AND PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.**

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, ADOPTING THE UPDATED VOLUSIA COUNTY LOCAL MITIGATION STRATEGY; AND PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, The City of Holly Hill is vulnerable to the human and economic costs of natural, technological and societal disasters as evidenced in the Four (4) Presidential Disaster Declarations since 2016; and

WHEREAS, the City Commission of the City of Holly Hill recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, The City of Holly Hill has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the County and its municipalities, as well as, other public, private and non-profit sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, Volusia County is asking for all jurisdictions to accept and endorse the Volusia County Local Mitigation Strategy.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. That the City Commission of the City of Holly Hill hereby accepts, approves and endorses the Volusia County Local Mitigation Strategy.

SECTION 2. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 3. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020.

VOLUSIA COUNTY, FLORIDA



MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY

PREPARED BY THE VOLUSIA PREPARES LMS WORKING GROUP
JANUARY 2020

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SECTION 1: INTRODUCTION

SECTION 1 – INTRODUCTION

This section of the Plan provides a general introduction to the Volusia County Multi-jurisdictional Local Mitigation Strategy (LMS). It consists of the following five subsections:

- ▶ **Background**
- ▶ **Purpose**
- ▶ **Scope**
- ▶ **Authority**
- ▶ **Summary of Plan Contents**

1.1 BACKGROUND

Natural hazards, such as hurricanes, floods and tornadoes, are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. We must consider these hazards to be legitimate and significant threats to human life, safety and property.

Volusia County, Florida is vulnerable to a wide range of natural hazards, including hurricanes and tropical storms, flooding, tornadoes and wildfires. These hazards threaten the life and safety of county residents, and have the potential to damage or destroy both public and private property and disrupt the local economy and overall quality of life of individuals who live, work and vacation in the community.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the impact of hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is generally referred to as *hazard mitigation*.



FEMA Definition of Hazard Mitigation:

“Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.”

Hazard mitigation techniques include both structural measures, such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards and non-structural measures, such as the adoption of sound land use policies and the creation of public awareness programs. It is widely accepted that the most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community’s overall hazard vulnerability.

SECTION 1: INTRODUCTION

As a community formulates a comprehensive strategy to hazard mitigation, a key component is to develop, adopt and update a Local Mitigation Strategy. An LMS/hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities. Each of the jurisdictions has adopted the LMS by resolution (Appendix A).

The Volusia County Multi-jurisdictional Local Mitigation Strategy has evolved over the years, as more thoroughly described in Section 2: Planning Process. The Volusia Prepares LMS Working Group (LMS Working Group) has developed Bylaws and Operating Procedures (Appendix B) to formalize the LMS update process and working group. The Plan documents and represents the County's and participating local jurisdictions' sustained efforts to incorporate hazard mitigation principles and practices into the routine government activities and functions of Volusia County and its participating jurisdictions and partners. This includes documenting the goals and objectives that Volusia County deems necessary to protect people and property from hazards. At its most inner core, the Plan recommends specific actions to combat hazard vulnerability and protect its residents from losses to those hazards that pose the greatest risk. Actions go beyond recommending micro-level solutions such as elevation, retrofitting and acquisition projects, and also address macro-level solution. Examples of macro-level actions that contribute to reducing the future vulnerability of Volusia County include local policies on community growth and development, incentives for natural resource protection and public awareness and outreach activities. Finally, the Plan is a living document, with implementation, evaluation and update procedures included to help achieve meaningful objectives and successful outcomes over time.

1.1.1 Disaster Mitigation Act of 2000

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate on mitigation planning activities, and makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP) and the newly-created Pre-Disaster Mitigation (PDM) program, both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally-approved hazard mitigation plan thereby become pre-positioned and are more apt to receive available mitigation funds before and after the next disaster strikes.

The Volusia County Multi-jurisdictional LMS has been prepared in coordination with FEMA Region IV and the Florida Division of Emergency Management to ensure that the Plan meets all applicable DMA 2000 and state requirements. A *Local Mitigation Plan Review Crosswalk*, found in Appendix C, provides a summary of federal and state minimum standards and notes the location where each requirement is met within the Plan.

SECTION 1: INTRODUCTION

1.2 PURPOSE

The purpose of the Volusia County Multi-jurisdictional LMS is to:

- ▶ **Provide a comprehensive update to the *Volusia County Local Hazard Mitigation Plan*, as previously amended in 2015, that is compliant with federal and state requirements.**
 - This Plan is intended to assist participating jurisdictions to comply with requirements in order to expedite the response and recovery process. In addition, compliance is often required to obtain state and federal funding for pre-disaster mitigation projects and post-disaster situations. This Plan allows participating jurisdictions to quickly assemble the necessary grant application materials when seeking funding.
- ▶ **Provide a methodical, substantive approach to mitigation planning.**
 - The use of a methodical approach ensures that each step in the planning process builds upon the last, resulting in a high level of assurance that proposed mitigation actions have a valid basis.
- ▶ **Enhance public awareness and understanding of hazard mitigation planning.**
 - Engaging the public in the local mitigation planning process shapes the goals, objectives and policies in this Plan. Further, it provides a method for educating the public on how to protect themselves from the impacts of hazards.
- ▶ **Create a decision tool for management.**
 - This plan provides local managers, leaders and officials with the tools needed to reduce vulnerabilities to future hazard events.
- ▶ **Enhance local policies for hazard mitigation capability.**
 - The Capability Assessment found in Section 7 outlines the policies in Volusia County and the participating jurisdictions to reduce hazard vulnerability. Volusia County the participating jurisdictions aim to enhance and create policies to address mitigating the impacts of a hazard if such policies do not already exist.
- ▶ **Assure inter-jurisdictional coordination of mitigation-related programming.**
 - By creating a multi-jurisdictional plan, this Plan ensures coordination of mitigation activities. This ensures that mitigation actions proposed or implemented by one jurisdiction will be compatible with the actions pursued by another.
- ▶ **Provide jurisdiction-specific hazard mitigation vulnerability assessments and actions.**
 - The vulnerability of each jurisdiction will be outlined in the Vulnerability Assessment. Further, each jurisdiction, based on its vulnerability, will have actions to address hazard vulnerability.

SECTION 1: INTRODUCTION

1.3 SCOPE

The focus of the Volusia County Multi-jurisdictional LMS is on those hazards deemed to be “high” or “moderate” risk as determined through a detailed hazard risk assessment conducted for Volusia County. Other hazards that pose a “low” or “negligible” risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables Volusia County and its participating jurisdictions to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes all areas within the unincorporated jurisdiction of Volusia County and the participating incorporated municipalities: Daytona Beach, Daytona Beach Shores, DeBary, DeLand, Deltona, Edgewater, Holly Hill, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona. In addition, other entities, such as the Volusia County School District, Halifax Medical Center, various Advent Health locations, American Red Cross and the Daytona Beach International Airport participated in the planning process. See Section 2, Table 2.1 for a full list of participating entities.

1.4 AUTHORITY

The Volusia County Multi-jurisdictional LMS has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans, and has been adopted by Volusia County and its participating jurisdictions and partners in accordance with standard local procedures. Copies of local adoption resolutions are provided in Appendix A. The Plan shall be routinely monitored and revised to maintain compliance with the following provisions, rules and legislation:

- ▶ Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390); and
- ▶ FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201.

1.5 SUMMARY OF PLAN CONTENTS

The contents of this Plan are designed and organized to be as reader-friendly and functional as possible. While significant background information is included on the processes used and studies completed (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plans).

Section 2: **Planning Process**, provides a complete narrative description of the process used to prepare the Plan. This includes the identification of who was involved, who participated on the planning team, and how the public and other stakeholders were involved. It also includes a detailed summary for each of the key meetings held along with any associated outcomes.

The **Community Profile**, located in Section 3, describes the general makeup of Volusia County, including prevalent geographic, demographic and economic characteristics. In addition, building characteristics

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and land use patterns are discussed. This baseline information provides a snapshot of the planning area and thereby assists local officials recognize those social, environmental and economic factors that ultimately play a role in determining community vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4: **Hazard Identification**; Section 5: **Hazard Profiles**; and Section 6: **Vulnerability Assessment**. Together, these sections serve to identify, analyze and assess the overall risk posed to Volusia County and the participating jurisdictions from hazards. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of Volusia County or its participating jurisdictions and partners.

The Risk Assessment builds on available historical data from past hazard occurrences, establishes detailed profiles for each hazard, and culminates in a hazard risk ranking based on conclusions about the frequency of occurrence, spatial extent and potential impact of each hazard. FEMA's HAZUS[®]^{MH} loss estimation methodology and Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS) results were also used in evaluating known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function as Volusia County and the participating jurisdictions seek to determine the most appropriate mitigation actions to pursue and implement—enabling it to prioritize and focus its efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The **Capacity Assessment**, found in Section 7, provides a detailed analysis of the capacity in Volusia County and the participating jurisdictions to implement meaningful mitigation strategies and identifies existing opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability and political capability. Information was obtained through the use of detailed survey questionnaires for local officials and an inventory and examination of existing plans, ordinances and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses or conflicts in programs or activities that may hinder mitigation efforts, and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

The **Community Profile**, **Risk Assessment** and **Capacity Assessment** collectively serve as a basis for determining the goals for the Volusia County Multi-jurisdictional LMS, each contributing to the development, adoption and implementation of a meaningful and manageable *Mitigation Strategy* that is based on accurate background information.

The **Mitigation Strategy**, found in Section 8, consists of broad countywide goal statements as well as an analysis of hazard mitigation techniques for Volusia County and its participating jurisdictions and partners to consider in reducing hazard vulnerabilities. The Strategy provides the foundation for a detailed **Mitigation Action Plan**, found in Section 9, which links specific mitigation actions for each County department or agency to locally-assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic (through the identification of long-term goals) but also functional through the identification of short-term and immediate actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make Volusia County and the participating

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jurisdictions less vulnerable to the damaging forces of hazards while improving the economic, social and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process, particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development and public health and safety.

Section 10: ***Plan Maintenance Procedures***, includes the measures that Volusia County and the participating jurisdictions will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

SECTION 2: PLANNING PROCESS

SECTION 2 – PLANNING PROCESS

44 CFR Requirement

44 CFR Part 201.6(c)(1): The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

This section describes the planning process undertaken by Volusia County in the development of the 2020 Multi-jurisdictional Local Mitigation Strategy. It consists of the following six subsections:

- ▶ **Overview of Hazard Mitigation Planning**
- ▶ **History of Hazard Mitigation Planning in Volusia County**
- ▶ **Preparing the 2020 Plan**
- ▶ **The Volusia Prepares Local Mitigation Strategy Working Group**
- ▶ **Community Meetings and Workshops**
- ▶ **Involving the Public and Identified Stakeholders**

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks and determining how to best minimize or manage those risks. This process results in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department or agency along with a schedule or target completion date for its implementation. Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the plan remains a current, dynamic and effective planning document over time that becomes integrated into the routine local decision-making process.

Mitigation planning offers many benefits, including:

- ▶ **Saving lives and property**
- ▶ **Saving money**
- ▶ **Speeding recovery following disasters**
- ▶ **Reducing future vulnerability through wise development and post-disaster recovery and reconstruction**
- ▶ **Expediting the receipt of pre-disaster and post-disaster grant funding**
- ▶ **Demonstrating a firm commitment to improving community health and safety**

Typically, mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that

SECTION 2: PLANNING PROCESS

the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery and reconstruction. Furthermore, mitigation practices will enable local residents, businesses and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN VOLUSIA COUNTY

Volusia County's hazard mitigation planning efforts began in 1997 with the formation of the Volusia Prepares Committee. The committee developed the first LMS in 1999 (adopted 2000), as part of the Florida Department of Community Affairs LMS Initiative. The previous version of the LMS, prior to the 2020 version, was updated and adopted in 2015.

2.3 PREPARING THE 2020 LMS

The 2020 LMS update was prepared by the East Central Florida Regional Planning Council with assistance from Volusia County Emergency Management Staff. The LMS Update process was led by Volusia County Emergency Management Plans Coordinator Aubrie Austin. The LMS plan was updated during October to December, 2019.

Per the contractual scope of work¹, the consultant team utilized the mitigation planning process recommended by FEMA (Publication Series 386) and recommendations provided by Florida Division of Emergency Management mitigation planning staff. A Local Mitigation Plan Crosswalk, found in Appendix C, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with the DMA 2000 and notes the location of where each requirement is met within the Plan. These standards are based upon FEMA's Interim Final Rule as published in the Federal Register on February 26, 2002, in Part 201 of the 44 Code of Federal Regulations.

The 2020 LMS was prepared using an updated plan outline and incorporated relevant content from the 2015 LMS. The LMS Working Group updated various parts of the 2015 LMS, as exemplified below:

- **Stakeholders**
The LMS Working Group identified additional stakeholders that they would like to participate in the LMS update process. These stakeholders were invited to subsequent meetings.

¹ A copy of the negotiated contractual scope of work between Volusia County and ECFRPC is available through Volusia County upon request.

SECTION 2: PLANNING PROCESS

- *Plan Outline*
The LMS Working Group did not revise the plan outline that was proposed by the consultant.
- *Hazards*
The LMS Working Group decided to include natural hazards starting with the 2009 LMS update, per DMA 2K requirements. Societal and technical hazards occurrences have not varied over the past five years, and many of these hazards are addressed through other emergency preparedness and response plans (e.g., Comprehensive Emergency Management Plan, Emergency Response Plan, Emergency Action Plan, etc.). This practice has been continued for the 2020 LMS.
- *Hazards Identification Scoring (for reference)*
In 2014, prior to this plan update, each jurisdiction reviewed the hazards scores that were included in the 2009 LMS (Comparison of Jurisdictional Relative Risk) and modified the scores for each hazard to reflect changes in the impacted area; probability of occurrence; and affects to the built and natural environment and economy.
- *Goals and Objectives*
The LMS Working Group reviewed the goals and objectives as part of the 2020 update cycle. Article III Section A, Goal 2 and Section 8.5 were amended.
- *Vulnerability Assessment*
The Vulnerability Assessment was updated using HAZUS and MEMPHIS data, as well as the most recent local parcel data (October 2019) for GIS analysis. Hazard maps, hazards exposure and loss estimates were also included. See Sections 4, 5 and 6 for further information.
- *Hazard Mitigation Initiatives*
The LMS Working Group decided to continue to use the Excel-based mitigation initiative status and scoring system. The consultant provided a proposed system that was reviewed and modified by the LMS Working Group. See Section 9 for further information.
- *LMS Working Group Bylaws and Operating Procedures (for reference)*
The LMS Working Group updated the Bylaws and Operating Procedures in 2014 with the facilitated assistance from the consultant with changes made since the 2009 LMS update.

Additionally, in 2009, a Capability Assessment was prepared, which was not included in the 2005 LMS. This assessment remains and has been updated for the 2020 LMS.

The process used to update this LMS included:

- Conducted the Preliminary Meeting with Volusia County Emergency Management to establish planning process, roles, responsibilities, etc. in preparation for the Kickoff Meeting.
- Conducted the Kickoff Meeting with the Volusia Prepares LMS Working Group
- Offered Kickoff Meetings (2) for the general public
- Developed the Vulnerability Assessment
- Developed the Capability Assessment

SECTION 2: PLANNING PROCESS

- Conducted two Mitigation Strategy Workshops with the Volusia Prepares LMS Working Group and invited the general public to attend. The first meeting focused on the plan outline and data collection process and the second focused on review of the first draft of the updated 2020 plan.
- Developed the Mitigation Strategy
- Developed a new tracking and scoring system for the Mitigation Initiatives
- Updated the Mitigation Initiatives status and scoring of potential projects
- Updated the LMS Plan Maintenance process

Each of these planning steps resulted in critical work products and outcomes that collectively make up the Plan. These elements have been included as separate sections of the Plan (further described in Section 1: Introduction).

The jurisdictions will consider using content from the LMS into other planning initiatives.

2.4 VOLUSIA PREPARES LOCAL MITIGATION STRATEGY WORKING GROUP

In order to guide the development of this Plan, Volusia County reconvened its Volusia Prepares LMS Working Group that was created under past planning efforts. Since the previous update, some changes have been made to the LMS working group in terms of personnel. The LMS Working Group includes representatives of various public, private and non-profit organizations throughout the county. The LMS Working Group represents a community-based planning team made up of local government officials and other key stakeholders identified to serve as critical partners in the planning process.

Opportunities were provided for all Volusia County jurisdictions, agencies, businesses, academia and other interested parties to participate in the LMS update process. All Volusia Prepares information is emailed out to over 125 city managers, business owners, chambers of commerce, agencies, non-profits, emergency managers and other county LMS coordinators.

Several non-profits (e.g., American Red Cross, Volusia Interfaiths/Agencies Networking in Disaster and United Cerebral Palsy) have participated in the LMS update process and have approved initiatives in the LMS. There is a Volusia Prepares Business group that has developed a Business Operations Center and emergency business database. They've also held several business planning workshops.

Beginning in September 2019, the LMS Working Group members engaged in regular discussions as well as local meetings and planning workshops to discuss and complete tasks associated with preparing the Plan. This working group coordinated together on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, committee members routinely communicated and were kept informed through an e-mail distribution list and Internet Web site.

Specifically, the tasks assigned to the LMS Working Group members included:

- Participate in LMS update meetings and workshops.
- Provide best available data as required for the risk assessment portion of the Plan.
- Help complete the local Capability Assessment Survey and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan.
- Support the development of the Mitigation Strategy, including the design and adoption of community goal statements.

SECTION 2: PLANNING PROCESS

- Help design and propose appropriate mitigation actions for their department/agency for incorporation into the Mitigation Action Plan. Provide a status update and assign a priority score to existing Mitigation Actions.
- Review and provide timely comments on all study findings and draft plan deliverables.
- Support the adoption of the 2020 Volusia County Multi-jurisdictional Local Mitigation Strategy by all participating jurisdictions.

In addition to these tasks, the Volusia Prepares LMS Working Group consists of a subcommittee responsible for the integration of the County's Program for Public Information (PPI) report into the workflow of the Volusia Prepares Working Group. This includes the creation of an annual report that reviews the status and applicability of the plan.

Table 2.1 lists the members of the Volusia County Prepares LMS Working Group who were responsible for participating in the development of the Plan.

NAME	JURISDICTION	Email
Ray Parkhurst	American Red Cross	Ray.parkhurst@redcross.org
Karen Feaster	Daytona Beach Intl Airport	kfeaster@volusia.org
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Justin Barton	Daytona Beach	bartonjustin@codb.us
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Jonathan Jacob	DeLand	jacobj@deland.org
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Bill Snyder	Deltona	bsnyder@deltonafl.gov
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Becky Weedo	Ormond Beach	weedo@ormondbeach.org
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Carmen Spelozzi	Pierson	carmen@townofpierson.org
Hank Baker	Ponce Inlet	hbaker@ponce-inlet.org

SECTION 2: PLANNING PROCESS

TABLE 2.2: Volusia County LMS Workgroup Members

NAME	JURISDICTION	EMAIL
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Aubrie Austin	Volusia County Emergency Management	alaustin@volusia.org
Jill Hemmerlein	Volusia County Emergency Management	jhemmerlein@volusia.org
Tom Carey	Volusia County Environmental Mgmt.	tcarey@volusia.org
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Howard Bailey	Volusia County Fire Dept./Public Protection	hbailey@volusia.org
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Arden Fontaine	Volusia County Public Works	afontaine@volusia.org
John Kraft	Volusia County School Board	jrkraft@volusia.k12.fl.us
Warren Greenberg	Volusia ARES	ae4wg@cfl.rr.com
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Margaret Epting	Florida Hospital Ormond Beach	Margaret.epting@fhms.org
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Ashley Fisher	Halifax Medical Center	Ashley.Fisher@halifax.org
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Denise Hutchinson	Women's Council of Realtors	denisehutchinson@adamscameron.com

2.2 COMMUNITY MEETINGS AND WORKSHOPS

The preparation of this Plan required a series of meetings and workshops for facilitating discussion, gaining consensus and initiating data collection efforts with local government staff, community officials and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the Plan. Below is a summary of the key meetings and community workshops held during the development of the plan update. In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their jurisdiction, department or agency to undertake and include in the Mitigation Action Plan.

The following is a summary of the meetings that occurred during the LMS update planning process. Meeting invitations, agendas, minutes and rosters are provided in Appendix D.

SECTION 2: PLANNING PROCESS

Volusia Prepares Kickoff Meeting

September 11, 2019

The Kickoff Meeting was held at the Volusia County Lifeguard Headquarters and Administration Center and was attended by the LMS Working Group. The primary purpose of the meeting was to explain the proposed planning process in detail, describe individual roles and responsibilities and begin initial data collection efforts. Discussions focused the key objectives, project tasks, schedule and staffing. The LMS Working Group was asked to identify additional stakeholders, new plans, data and studies to incorporate into the LMS update. The LMS Working Group was also presented with a proposed plan outline. Each jurisdiction was asked to update their Hazards Identification (Comparison of Jurisdictional Relative Risk from 2014 LMS). See Appendix D for more information.

Public Meetings

October 29, 2019

Two public meetings were held to inform the public of the planning process and the overall scope of the 2020 Volusia County Local Mitigation Strategy. Maps and a draft plan were provided and general items within the plan were discussed. Special attention was given to community member needs and recommendations for the plan. This day was also utilized to submit a draft to all County and jurisdictional representatives. See Appendix D for more information.

Volusia Prepares Meeting #2

December 11, 2019

The next Local Mitigation Strategy Meeting was held at the Volusia County Lifeguard Headquarters and Administration Center. The purpose of this meeting was to show the jurisdictions the draft plan and obtain comments. See Appendix D for more information.

2.6 INVOLVING THE PUBLIC AND IDENTIFIED STAKEHOLDERS

The public and community stakeholders were invited to two "Public Meetings" (October 29, 2019) during the LMS planning process (see Appendix D), and were also invited to the Volusia Prepares meetings conducted on September 11th and December 11th. A press release was issued from Volusia County Community Information, by the Volusia County Public Information Officer, to invite the public to participate in the LMS development and provide comments on the LMS. The press release included background information about the LMS process, the agenda topics, date, time and location information. Public feedback would have been received by emails, at meetings, or by contacting the LMS Coordinator. In addition, the LMS was also placed on the Volusia County Emergency Management Website: <http://www.volusia.org/emergency/>

As listed in Table 2.1, the LMS Working Group includes representation from various stakeholders in the community, in addition to the participating jurisdictions' local government staff.

SECTION 3: COMMUNITY PROFILE

SECTION 3 – COMMUNITY PROFILE

This section of the Plan provides an overview of Volusia County, Florida. It consists of the following five subsections:

- ▶ **Geography and the Environment**
- ▶ **Population and Demographics**
- ▶ **Housing, Infrastructure and Land Use**
- ▶ **Employment and Industry**
- ▶ **Development Trends**

3.1 GEOGRAPHY AND THE ENVIRONMENT

Volusia County was established in 1854 as a prosperous steamboat landing area. It lies on the central coast of eastern Florida and is comprised of 1,103 square miles of land and 329 square miles of water (bounded to the north and south by the coastal counties of Flagler and Brevard). Several counties border Volusia County to the west including Putnam, Marion, Lake and Seminole. The County is located approximately 40 miles from Orlando, 95 miles from Jacksonville and 105 miles from Tampa, Florida.

There are 16 incorporated areas within Volusia County, of which Deltona is the largest in terms of population. An orientation map of the Volusia County study area is provided as **Figure 3.1**. The participating jurisdictions in this plan include Daytona Beach, Daytona Beach Shores, DeBary, Del and Deltona, Edgewater, Holly Hill, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange, South Daytona, and the unincorporated area of Volusia County.

Forest land accounts for approximately 56 percent of the land area in Volusia County¹. There is an abundance of public land in Volusia County. For example, the northern portion of the county, abutting Flagler County, is located in the North Peninsula State Recreation Area. In addition, the southern coastal portion of the county, adjacent to Brevard County, is part of the Canaveral National Seashore.

The climate in Volusia County is considered sub-tropical with generally warm, humid temperatures year-round. The average winter temperature is 62 degrees Fahrenheit. The average summer temperature is 81 degrees Fahrenheit, though it typically exceeds 90 degrees Fahrenheit in the months of June, July, and August. The average annual precipitation is 49 inches.

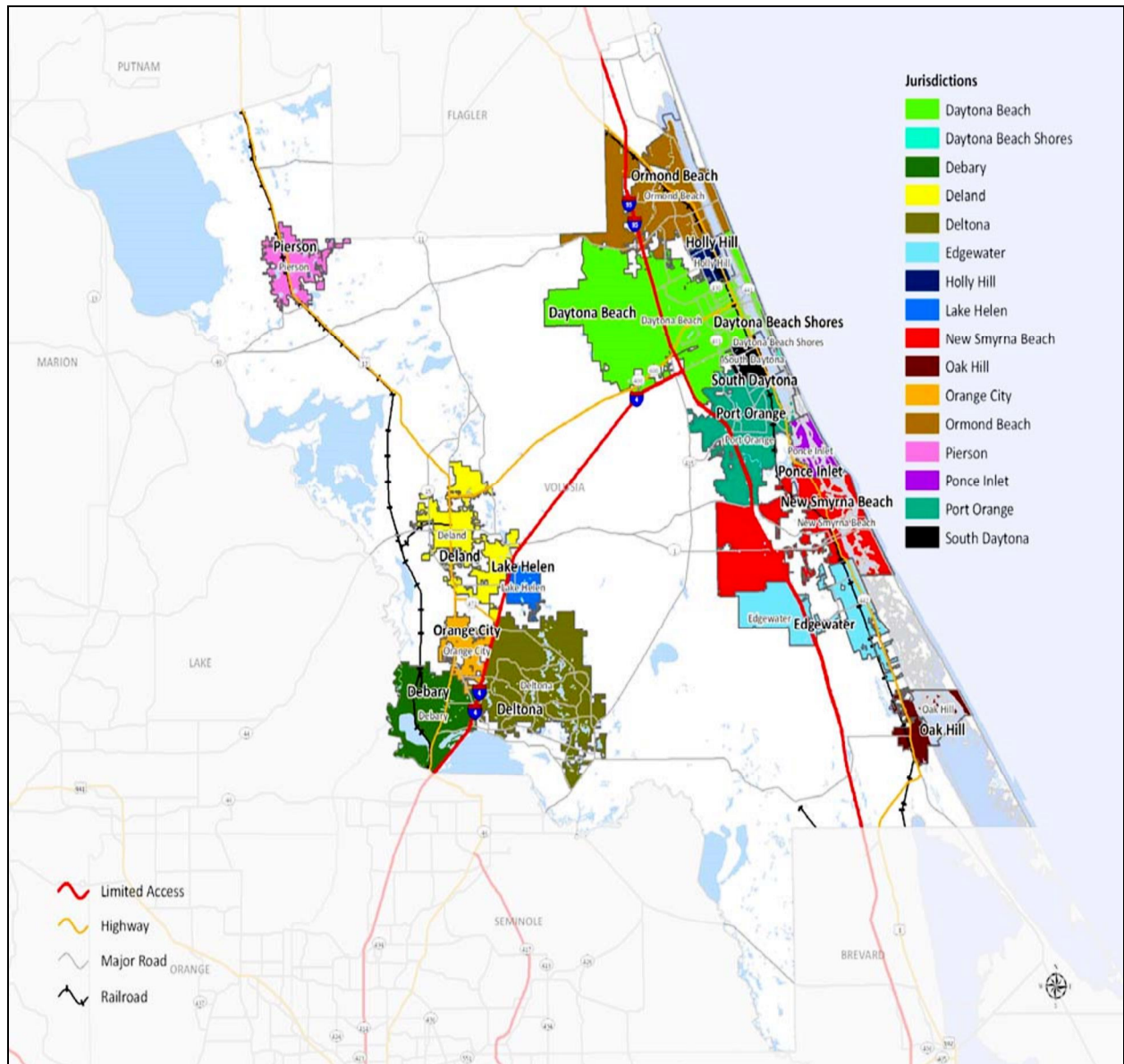
The dominant surface water resources in Volusia County are Mosquito Lagoon, Lake George (37,884 acres), Lake Monroe (5,423 acres), and Lake Harney (3,210 acres)². There are many other water areas throughout the County, which are fed by numerous creeks, bayous and other minor tributaries.

¹ <http://www.freshfromflorida.com>

² Volusia County Comprehensive Plan, Figure 1-2 Legend for Water Bodies

SECTION 3: COMMUNITY PROFILE

FIGURE 3.1: Volusia County Study Area Map



Source: Volusia County GIS

SECTION 3: COMMUNITY PROFILE

3.2 POPULATION AND DEMOGRAPHICS

According to the U.S. Census Bureau, the 2017 estimated population of Volusia County was 518,660. This represents a 4.9 percent increase from 2010, when the population was 494,593, and a slightly lower change compared to the State percent change of 12.3 percent. **Table 3.1** provides the 2010 populations of the cities and unincorporated areas within Volusia County along with the 2017 population estimates as provided by the U.S. Census Bureau. In addition, **Figure 3.2** shows the population distribution by block group in Volusia County.

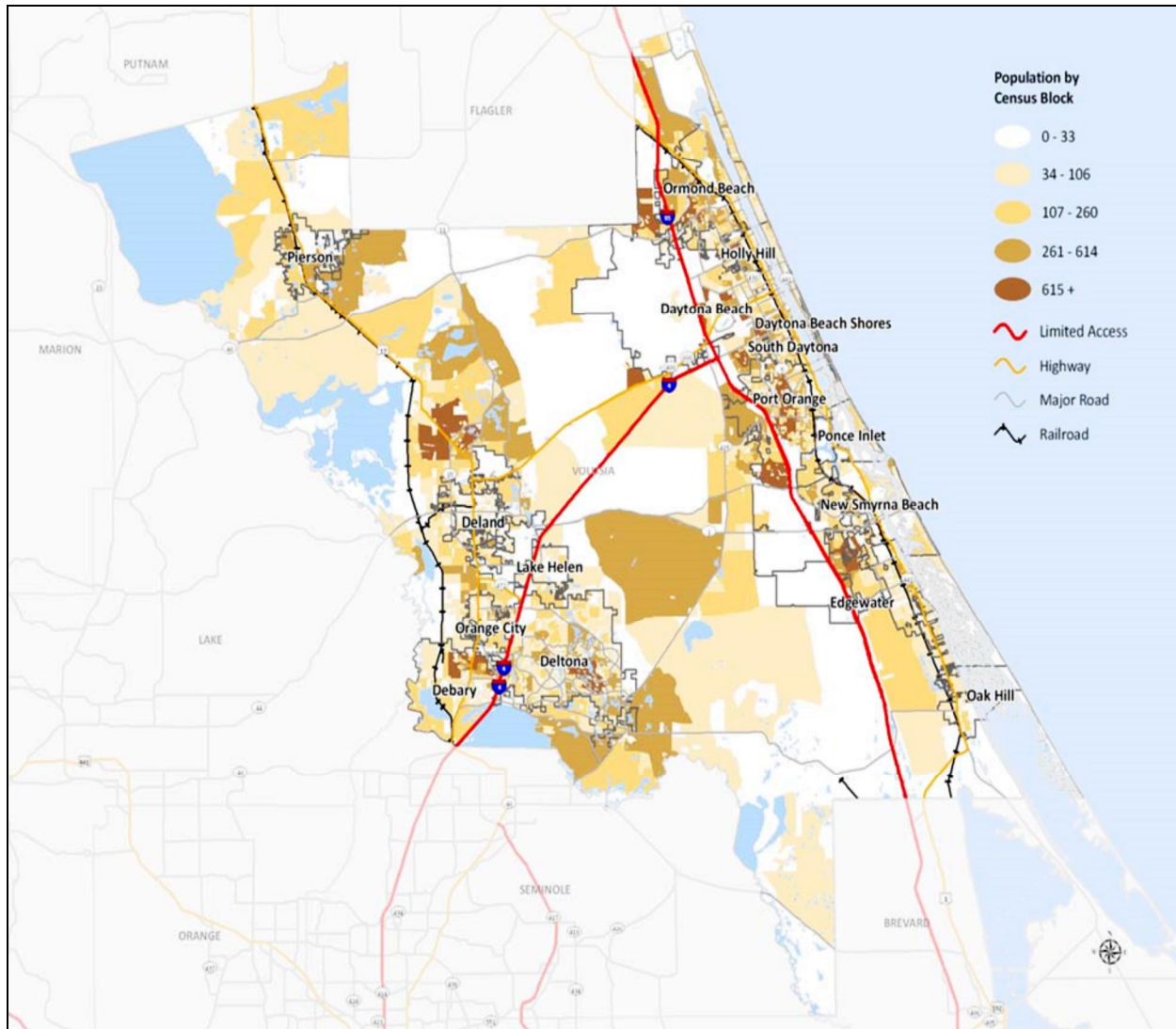
TABLE 3.1: Population of Cities and Unincorporated Areas in Volusia County

JURISDICTION	2010 POPULATION	2017 POPULATION ESTIMATE
Daytona Beach	61,005	68,055
Daytona Beach Shores	4,247	4,514
DeBary	19,320	20,784
DeLand	27,031	32,506
Deltona	85,182	90,746
Edgewater	20,750	22,399
Holly Hill	11,659	12,218
Lake Helen	2,624	2,780
New Smyrna Beach	19,537	26,470
Oak Hill	1,792	2,127
Orange City	10,599	11,697
Ormond Beach	38,137	42,816
Pierson	1,736	1,883
Ponce Inlet	3,032	3,241
Port Orange	56,048	63,203
South Daytona	12,252	12,936
Unincorporated	119,642	119,805

Source: U.S. Census Bureau & American Community Survey (2017)

SECTION 3: COMMUNITY PROFILE

Figure 3.2: Population of Cities and Unincorporated Areas in Volusia County



Source: U.S. Census Bureau (2010)

According to the 2017 U.S. Census American Community Survey, the median age for the County was 46.4 years. This is slightly higher than the Florida median age of 41.8 years of age. It is estimated that 20.4 percent of the County's population is made up of persons that are 65 years old and over, which is expectedly higher than the State figure of 17.4 percent.

The racial mix in Volusia County is predominately white, but has other populations. White persons make up 82.5 percent of the County's population. Black or African American persons accounted for 10.5 percent of the Volusia County population, less than the state percentage of 16.0 percent. Asians comprised 1.5 percent of the population compared to the State's 3.4 percent. People of two or more races comprised 2.1 percent of the population in the County.

SECTION 3: COMMUNITY PROFILE

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the Census Bureau’s 2013-2017 American Community Survey, there are 258,012 housing units in Volusia County. Of these structures, 62.1 percent are single-unit and 22.2 percent are multi-unit. The remaining 8.7 percent are mobile homes or other types of housing. The median value of owner-occupied housing units was \$142,200, compared to the \$178,700 average in Florida and the \$123,500 national average.

3.3.2 Infrastructure

Infrastructure is categorized in this Plan as Transportation and Utilities, as these elements are vital in a disaster event, both for evacuation and for response and recovery efforts. Volusia County is endowed with multi-modes of transportation and has several utility providers.

Transportation

Volusia County has several transportation options whether traveling by automobile, rail, or air. There are two federal interstates which run through the County: Interstate 5 runs north to south along the coast, and Interstate 4 runs northeast, connecting the County to Orlando, and merging with I-5 near Daytona Beach. There are also four federal highways (U.S. 1, U.S. 17, U.S. 40 and U.S. 92). There are also four major railway transportation providers (Amtrak, CSX, Florida East Coast Railway, and SunRail), and a number of regional airports. The major area airport is Daytona Beach International Airport. In addition, Port Canaveral, a deep-water port, and one of the busiest cruise ports in the world, is located about 70 miles south of Volusia County in Brevard County.

Utilities

Florida Power and Light, Duke Energy, City of New Smyrna Beach Utilities Commission, and Clay Electric Cooperative serve the electricity needs in Volusia County. The natural gas suppliers are Florida Public Utilities and TFC People’s Gas. Water and sewer services are provided by a number of different sources including Volusia County Utilities, North Peninsula Utilities Corporation, and municipal governments.

SECTION 3: COMMUNITY PROFILE

3.3.3 Land Use

Table 3.2 shows the remaining vacant residential, vacant commercial and vacant industrial land available for development in Volusia County as of 2019.

JURISDICTION	VACANT RESIDENTIAL	VACANT COMMERCIAL	VACANT INDUSTRIAL
Daytona Beach	1,174 Acres	1,353 Acres	139 Acres
Daytona Beach Shores	10 Acres	23 Acres	0 Acres
DeBary	612 Acres	182 Acres	2 Acres
DeLand	764 Acres	358 Acres	121 Acres
Deltona	1,322 Acres	592 Acres	243 Acres
Edgewater	150 Acres	37 Acres	188 Acres
Holly Hill	114 Acres	81 Acres	34 Acres
Lake Helen	673 Acres	99 Acres	8 Acres
New Smyrna Beach	938 Acres	812 Acres	57 Acres
Oak Hill	0 Acres	0 Acres	0 Acres
Orange City	323 Acres	845 Acres	113 Acres
Ormond Beach	579 Acres	652 Acres	71 Acres
Pierson	558 Acres	42 Acres	0 Acres
Ponce Inlet	94 Acres	14 Acres	0 Acres
Port Orange	491 Acres	553 Acres	30 Acres
South Daytona	58 Acres	116 Acres	23 Acres
Unincorporated Area	30,352 Acres	1,164 Acres	290 Acres

Source: Volusia County Property Appraiser, Department of Revenue Land Use Codes (2019)

3.4 EMPLOYMENT AND INDUSTRY

Volusia County began as prosperous steamboat landing town in the early 1800s. Today, employment is based largely in the public sector. According to the 2017 American Community Survey, the civilian labor force in Volusia County is approximately 212,016. The top employers are Volusia County Schools, Halifax Health and Volusia County Government.

From an industry perspective, Volusia County has a high number of retail trade employees (29,620), construction employees (17,464) and professional, scientific and technical service employees (22,876)³. These figures reflect the high proportion of people working in the construction, education, and tourism industries.

In 2017, the estimated median household income for Volusia County was \$43,838, less than the State and U.S. medians of \$50,883 and \$57,652, respectively.

³ American Community Survey 2013-17

SECTION 3: COMMUNITY PROFILE

3.5 DEVELOPMENT TRENDS

Volusia County experienced substantial growth between 2000 and 2005 followed by a sharp decline in growth between 2009 and 2012, as indicated by U.S. Census residential building permit data. Growth has generally rebounded since 2013 (**Table 3.3**).

TABLE 3.3: Annual Residential Building Permit Data, Volusia County

YEAR	TOTAL RESIDENTIAL UNITS	YEAR OVER YEAR CHANGE
2000	3,147	---
2001	5,112	+ 1,965
2002	4,171	-941
2003	5,112	+ 941
2004	4,920	- 192
2005	5,186	+ 266
2006	2,961	- 2,225
2007	1,577	- 1,384
2008	1,053	- 524
2009	600	- 453
2010	653	+ 53
2011	539	- 114
2012	760	+ 221
2013	1,307	+ 547
2014	1,205	- 102
2015	987	- 218
2016	1,077	+ 90
2017	1,496	+ 419
2018	1,598	+ 102

Source: U.S. Census Bureau, 2013-2017 ACS

Currently, one major development planned in unincorporated Volusia County is scheduled. The Farmton Local Plan property is a development of regional impact (DRI) located south of Edgewater and west of I-95 to the Brevard County Line. It is approximately 47,000 acres, of which more than 30,000 acres are protected by conservation easements and covenants. The plan established two future land use designations; Green Key and Sustainable Development Area (SDA) with a maximum development potential of 23,100 dwelling units and 4,700,000 square feet of nonresidential building area. The plan became effective on March 29, 2012⁴.

For a list of new developments in Volusia County please visit the Land Development section of the Volusia County Growth and Resource Management Department website at the following link: <http://www.volusia.org/services/growth-and-resource-management/planning-and-development/land-development/>

⁴ Volusia County Growth and Resource Management

SECTION 4: HAZARD IDENTIFICATION

SECTION 4 – HAZARD IDENTIFICATION

This section is the first of three sections that assess the risk of Volusia County and the participating jurisdictions to natural hazards. This section identifies a wide range of hazards that could potentially impact the County. Section 5: **Hazard Profiles**, provides more detailed information about how the identified hazards specifically impact the County and participating jurisdictions. Section 6: **Vulnerability Assessment** provides detailed analyses results that indicate the amount of damages that could occur in the County as a result of the identified hazards. Together, these sections serve to identify, analyze and assess the overall risk posed to Volusia County and the participating jurisdictions from hazards. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of Volusia County or its participating jurisdictions and partners.

Volusia County and the participating jurisdictions are vulnerable to a wide range of natural hazards¹ that threaten life and property. Upon a review of the full range of natural hazards suggested under FEMA planning guidance, Volusia County and the participating jurisdictions have identified a number of hazards that are to be addressed in this Multi-jurisdictional LMS. These hazards were identified through an extensive process that utilized input from the Local Mitigation Strategy Working Group (LMS Working Group) members, research of past disaster declarations in the County, a review of previous hazard mitigation plans in the County, and a review of the current Florida Hazard Mitigation Plan. Readily available online information from reputable sources such as federal and state agencies was also evaluated to supplement information from these key sources.

Table 4.1 lists the full range of natural hazards initially identified for consideration in the Plan and provides a brief description for each. This table includes thirteen individual hazards categorized by the following types: atmospheric, hydrologic, geologic, and other. Some of these hazards are considered to be interrelated or cascading (i.e., hurricanes can cause flooding, storm surge and tornadoes), but for preliminary hazard identification purposes these distinct hazards are broken out separately. It should also be noted that some hazards, such as drought or winter storms may impact a large area yet cause little damage, while other hazards, such as a tornado, may impact a small area yet cause extensive damage.

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
ATMOSPHERIC	
Hail	A hail event is caused by any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. Hail is formed when updrafts in thunderstorms carry raindrops in to parts of the atmosphere where the temperatures are below freezing.

¹ In addition to a full range of natural hazards, an evaluation of human-caused hazards (e.g., technological hazards, terrorism, etc.) is encouraged, though not required, for plan approval. Volusia County has focused solely on natural hazards at this time. Incorporation of human-caused hazards may be considered in the future.

SECTION 4: HAZARD IDENTIFICATION

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
Hurricane and Tropical Storm Wind	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter averaging 10 to 20 miles across. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea and Gulf of Mexico during the official Atlantic hurricane season, which extends from June through November.
Lightning	Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 24 people are killed each year by lightning strikes in the United States.
Severe Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
Thunderstorm	Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm moist air fuels the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 200 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size and duration of the storm.
HYDROLOGIC	
Coastal Erosion	Landward displacement of a shoreline caused by the forces of waves and currents define coastal erosion. Coastal erosion is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. It is generally associated with episodic events such as hurricanes and tropical storms, nor'easters, storm surge and coastal flooding but may also be caused by human activities that alter sediment transport. Construction of shoreline protection structures can mitigate the

SECTION 4: HAZARD IDENTIFICATION

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
	hazard, but may also exacerbate it under some circumstances.
Drought	A drought is a prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities.
Flood	The accumulation of water within a water body which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream ocean, lake or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine, coastal, or shallow flooding (which includes sheet flow, ponding, and urban drainage).
Storm Surge	A storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four to five feet in a Category 1 hurricane up to more than 20 feet in a Category 5 storm. Storm surge heights and associated waves are also dependent upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. Storm surge arrives ahead of a storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast.
Sea Level Rise	Sea level rise has been observed over the past few decades in Central Florida, including Volusia County. Projections by NOAA and the U.S. Army Corps of Engineers depict varying levels of sea level rise by the year 2100. As part of this plan, sea level rise and sea level rise-plus storm surge are analyzed.
Geologic	
Sinkhole	Sinkholes are formed when the underlying limestone or other rock type collapses, resulting in a depression. Limestone is soluble in natural water, causing the collapse.
Tsunami	A series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively pile up, and wave heights to increase dramatically. As opposed to typical waves which crash at the shoreline, tsunamis bring with them a continuously flowing wall of water.
OTHER	
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban-wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by

SECTION 4: HAZARD IDENTIFICATION

TABLE 4.1: Descriptions of the Full Range of Initially Identified Hazards

HAZARD	DESCRIPTION
	human factors. Over 70 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.
Civil Disturbance ***	Civil disturbances can occur due to socio-economic, political or other reasons. These types of events typically occur in public places, including court houses or town civic spaces.
Coastal Oil Spill ***	While oil spills would primarily affect the Gulf coast of Florida, oil spills can negatively affect tourism and ecological conditions on the Atlantic coast of Florida.
Terrorism ***	Terrorism includes any attempt to attack, cripple or damage public goods, public infrastructure or citizens on a large scale.
Mass Migration ***	Mass-migration occurs when persons of one geographic area move in large numbers to another geographic location.
HazMat ***	Hazardous material (HazMat) includes events when liquid, solid or gaseous chemicals that are harmful or fatal to humans or ecological infrastructure disperse into the atmosphere.
Agro-terrorism ***	Agro-Terrorism includes any attempt to maliciously destroy or harm the agricultural industry, the secondary effects of which can be disease, famine and massive economic loss.
Public Health Emergencies ***	Public health emergencies include medical surges (often from mass casualty events) that require hospitals to act beyond normal capacity. Pandemics are included in this category.
Cyber Attack ***	Cyber-attacks include the use of electronic devices to attack, cripple or damage information systems held by governmental or private institutions, as well as individual citizens.
Agricultural Infestation	Agricultural infestations include disease and other malfunctions in biological entities resulting in viruses and other bacteria that pose a threat to human life and safety.
NOT INCLUDED	
Earthquake	Earthquakes are not included in this analysis due to their very low frequency in Central Florida and Volusia County. Earthquakes do not occur in Florida, but rather off the Gulf of Mexico or in the Caribbean.

*** SPECIAL NOTE: The following "man-made" hazards are analyzed in terms of the vulnerability they pose to the Volusia County community and the potential mitigation activities that can be implemented within [Section 7, Capability Assessment](#); [Section 9, Mitigation Action Plan](#); [Appendix H, HIRA Consequences](#), and; [Appendix J, Consequences by Hazard](#). These hazards are not analyzed for their vulnerability to the community within the Vulnerability Assessment (Section 6) of this document, as that section is limited to the hazards that can be analyzed utilizing Geographic Information Systems (GIS) on a county-wide basis.

SECTION 5: HAZARD PROFILES

SECTION 5 – HAZARD PROFILES

44 CFR Requirement**44 CFR Part 201.6(c)(2)(i):**

The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

5.1 OVERVIEW

This section includes detailed hazard profiles for each of the hazards identified in the previous section as significant enough for further evaluation through the risk assessment in Volusia County. This includes the following hazards:

- ▶ **Atmospheric**
 - Hail
 - Hurricane and Tropical Storm
 - Lightning
 - Severe Winter Storm
 - Thunderstorm
 - Tornado
- ▶ **Hydrologic**
 - Coastal Erosion
 - Drought
 - Flood
 - Storm Surge
 - Sea Level Rise
- ▶ **Geologic**
 - Sinkhole
 - Tsunami
- ▶ **Societal, Ecological and Technological**
 - Wildfire
 - Cyber Attack
 - Civil Disturbance
 - Coastal Oil Spill
 - Terrorism
 - Mass Migration
 - HazMat
 - Agro-terrorism
 - Public Health Emergencies
 - Agricultural Infestation

SECTION 5: HAZARD PROFILES

Each hazard profile described in this section includes a general description of the hazard, its location and extent, notable historical occurrences and the probability of future occurrences. It also includes specific items noted by members of the Local Mitigation Strategy Working Group (LMS Working Group) as it relates to unique historical or anecdotal hazard information for Volusia County or a particular jurisdiction. The probability of future occurrence is expressed as **high** (expected to occur at least every five years), **moderate** (expected to occur at least every 25 years), **low** (expected to occur at least every 100 years, and **very low** (is possible to occur, despite their being no recorded occurrences).

Major Disaster Declarations

In 1974, the Robert T. Stafford Disaster Relief and Emergency Assistance Act was enacted to support state and local governments when disasters overwhelm local resources. This law, as amended, establishes a process for requesting and obtaining a Presidential Disaster Declaration, defines the type and scope of assistance available from the federal government, and sets the conditions for obtaining that assistance. The Federal Emergency Management Agency (FEMA), now part of the Emergency Preparedness and Response Directorate of the Department of Homeland Security, is tasked with coordinating the response. Since 1965, Volusia County has received numerous presidential disaster declarations for such hazards as hurricanes, tornados, floods and severe freezes (**Table 5.1**).

TABLE 5.1: Presidential Disaster Declarations

EVENT	DECLARATION DATE	DECLARATION NUMBER
Severe Storms, Tornadoes, and Flooding	05/15/77	506
Tornadoes, Flooding, High Winds & Tides, Freezing	07/17/77	702
Tropical Storm Gordon, Tornadoes, Flooding	11/22/74	1040
Tropical Storm Josephine	10/15/76	1141
Severe Storms, High Winds, Tornadoes, Flooding	02/25/77	1105
Extreme Fire Hazard	07/07/77	1220
Hurricane Floyd	07/22/77	1700
Hurricane Irene	10/22/77	1706
Severe Freeze	02/06/01	150
Hurricane Charley/Donnie	07/17/04	1500
Hurricane Frances	07/04/04	1545
Hurricane Ivan	07/15/04	1551
Hurricane Jeanne	07/26/04	1561
Hurricane Katrina Evacuation	07/05/05	2220
Severe Storms, Tornadoes	02/20/07	1600
Severe Storms, Tornadoes, and Flooding	02/20/07	1600
Tropical Storm Fay	07/21/07	2200
Severe Storms, Flooding, Tornadoes, Straight-line Winds	05/27/07	1740
Hurricane Matthew	10/20/16	2200

SECTION 5: HAZARD PROFILES

Hurricane Irma	07/20/2017	2225
Hurricane Michael	10/20/2017	2405
Hurricane Dorian	07/22/2017	2420

Source: Federal Emergency Management Agency

Volusia County Emergency Management has had 52 significant disaster events that resulted in the activation of their Emergency Operations Center. There were 77 percent that were natural hazard events, underscoring that natural hazards pose a very high risk to Volusia County. **Table 5.2** lists these events by type, area of impact, EOC activation level, the estimated number of parcels (properties) that were damaged and loss estimates.

TABLE 5.2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				# Parcels	Dollars
07/20/2017	Wind Storm	County-Wide	Level 2 (Part)	1222	16,242,255
5/24/2014	Tornado	Holly Hill	Level 2 (Part)	222	6,620,000
2/26/2014	I-4 Chemical Spill	SW Volusia	Level 1 (Mon)	22A	22A
11/21/2014	T.S. Gordon	County-Wide	Level 2 (Part)	652	10,602,224
07/22/2017	Hurricane Erin	Edgewater	Level 2 (Full)	21	65,052
07/11/2016	Wind Storm	Daytona Beach	Level 1 (Mon)	2	22,000
07/10/2016	Hurricane Bertha	County-Wide	Level 2 (Part)	22A	22A
05/21/2016	Hurricane Fran	County-Wide	Level 2 (Part)	22A	22A
10/22/2016	T.S. Josephine	County-Wide	Level 1 (Mon)	122	1,222,242
4/22/2017	Tornado	St. Johns Peninsula	Level 2 (Part)	22	525,600
05/21/2017	Tornado	Lake Hill	Level 1 (Mon)	6	22,000
11/22/2017	Tornado	St. Johns Main St Penn	Level 2 (Part)	212	11,020,222
2/22/2017	Wind Storm	Deethune Beach	Level 1 (Mon)	1	20,000
2/22/2017	Tornado	Daytona Beach	Level 2 (Part)	616	2,425,552
6/22/2017	Fire Storm "22"	County-Wide	Level 4 (Full)	22	2,126,012
07/22/2017	Tornado	Daytona Beach	Level 1 (Mon)	46	152,000
1/22/2017	Wind Storm	SR 415 Area	Level 1 (Mon)	2	2,100
1/22/2017	Wind Storm	Daytona Beach	Level 1 (Mon)	11	52,000
07/14/2017	Hurricane Floyd	East Side	Level 1 (Full)	422	12,655,252
10/16/2017	Hurricane Irene	East Side	Level 2 (Part)	125	16,222,266
1/21/2000	222	County-Wide	Level 1 (Full)	22A	22A
5/21/2000	Wildfires 2000	County-Wide	Level 2 (Part)	22A	22A
07/16/2000	Hurricane Gordon	County-Wide	Level 2 (Part)	22A	22A
07/17/2000	Wind Storm	DeLand	Level 2 (Part)	12	62,226
07/17/2001	Tornado	Daytona Beach	Level 2 (Part)	122	2,210,225
07/11/2001	National Terrorism Event	County-Wide	Level 2 (Part)	22A	22A
07/14/2001	T.S. Gabrielle	County-Wide	Level 2 (Part)	44	424,125
11/15/2001	Rain Event	East Volusia	Level 2 (Part)	22	561,200
4/17/2002	Amtrak Derailment	Putnam Co.	Level 2 (Part)	22A	5,000
07/24/2002	T.S. Edouard	County-Wide	Level 2 (Part)	22A	22A

SECTION 5: HAZARD PROFILES

TABLE 5.2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				# Parcels	Dollars
1/1/2002	Water Plant Breach	DeBary	Level 2 (Part)	27A	\$0,000
7/7/2004	Pepsi 400 is Race	Daytona Beach	Level 2 (Part)	27A	27A
8/1/2004	Hurricane Charley	County-Wide	Level 1 (Full)	5212	106,200,000
8/24/2004	Hurricane Frances	County-Wide	Level 1 (Full)	26264	222,200,000
8/25/2004	Hurricane Jeanne	County-Wide	Level 1 (Full)	U22	52,500,000
8/22/2005	Pepsi 400 is Race	Daytona Beach	Level 2 (Part)	27A	27A
8/27/2005	T.S. Phelia	County-Wide	Level 2 (Part)	each	27A
10/22/2005	Hurricane Wilma	County-Wide	Level 2 (Part)	2	\$52,000
2/1/2006	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	27A
7/1/2006	Pepsi 400 is Race	Daytona Beach	Level 2 (Part)	27A	27A
8/22/2006	T.S. Ernesto	County- Wide	Level 2 (Part)	27A	27A
12/25/2006	Tornado	DeLand-Daytona Bch.	Level 2 (Mon)	210	\$2,000,000
2/2/2007	Tornado	DeLand-St	Level 2 (Part)	221	60,552,221
2/1/2007	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	27A
5/6/2007	Airport Road Fire	Volusia/Flagler Co.	Level 2 (Part)	27A	27A
7/7/2007	Pepsi 400 is Race	Daytona Beach	Level 2 (Part)	27A	27A
2/1/2007	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	27A
7/5/2007	Coke 400 is Race	Daytona Beach	Level 2 (Part)	27A	27A
7/1/2007	T.S. Fay	County-Wide	Level 1 (Full)	240	12,520,016
2/15/2007	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	27A
5/1/2007	May Rain Storm	County-Wide	Level 2 (Part)	1654	62,516,202
7/7/2007	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	27A
7/24/2007	Port Orange Tornado	Port Orange	Level 2 (Monitor)	125	2,210,661
2/14/2010	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	
7/7/2010	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	
2/20/2011	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	
2/22/2011	Iron Horse Fire (12,012 a.)	Volusia County	Level 2 (Monitor)	27A	
5/26/2011	Volusia Command Fires	Volusia County	Level 2 (Monitor)	27A	
6/2/2011	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	
2/26-2/27/12	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	
7/7/2012	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	
12/11-12/12	Tornado Terra Mar	Edgewater	Level 2 (Part)	27A	1,622,422
2/24/2012	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	
7/2/2012	Thurance Fire	Ormond Beach	Level 2 (Monitor)	27A	
6/6/2012	Tropical Storm Andrea	Countywide	Level 2 (Monitor)	27A	
7/6/2012	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	
2/22/2014	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	
7/1/2014	Tropical Storm Arthur	Countywide	Level 2 (Monitor)	27A	
7/7/2014	T.S. Arthur	Countywide	Level 2 (Part)	27A	
7/5-6/2014	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	
7/22/2014	Go Home Rain Event	Port Orange-St	Level 2 (Part)	150	1,500,000
7/22/2015	Daytona 500 Race	Daytona Beach	Level 2 (Part)	27A	27A
5/5/2015	Coke Hero 400	Daytona Beach	Level 2 (Part)	27A	27A

SECTION 5: HAZARD PROFILES

TABLE 5.2: Significant Activation Events

Date of Event	Type of Event	Area of Event	EOC Level Activation	Damage Estimate	
				# Parcels	Dollars
11-2-2015	T.S. Erika	Daytona Beach	Level 2 (Part)	2A	2A
2-21-2016	Daytona 500 Race	Daytona Beach	Level 2 (Part)	2A	2A
5-28-2016	Country 500	Daytona Beach	Level 2 (Part)	2A	2A
6-25-2016	T.S. Colin	Daytona Beach	Level 2 (Part)	2A	2A
7-22-2016	Coke Zero 400	Daytona Beach	Level 2 (Part)	2A	2A
10-26-2016	Hurricane Matthew	Countywide	Level 1 (Full)	2A	422,500,000
2-26-2017	Daytona 500 Race	Daytona Beach	Level 2 (Part)	2A	2A
5-26-2017	Country 500	Daytona Beach	Level 2 (Part)	2A	2A
7-22-2017	Coke Zero 400	Daytona Beach	Level 2 (Part)	2A	2A
9-25-2017	Hurricane Irma	Countywide	Level 1 (Full)	2A	221,021,000
2-21-2017	Daytona 500 Race	Daytona Beach	Level 2 (Part)	2A	2A
5-25-2017	Country 500	Daytona Beach	Level 2 (Part)	2A	2A
7-22-2017	Coke Zero 400	Daytona Beach	Level 2 (Part)	2A	2A
2-21-2017	Daytona 500 Race	Daytona Beach	Level 2 (Part)	2A	2A
7-22-2017	Coke Zero 400	Daytona Beach	Level 2 (Part)	2A	2A
9-22-2017	Hurricaneorian	Countywide	Level 1 (Full)	T22	T22
Totals----->				40,320	1,706,110,346

Source: Volusia County Emergency Management Division (Revised 10-16-2017)

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS COMPLETED
 THE ANNUAL CLIMATIC DATA CENTER

SECTION 5: HAZARD PROFILES

ATMOSPHERIC HAZARDS

5.2 HAIL

5.2.1 Background

Hail frequently accompanies thunderstorms and has potential to cause substantial damage. Early in the developmental stages of a hail, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop sufficient weight to fall as precipitation. Hail precipitation falls in sphere or irregularly shaped masses greater than 0.25 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.

5.2.2 Location and Spatial Extent

Hail is often produced during a thunderstorm event which has no geographic limitations to the area it affects. Therefore, it is assumed that all of Volusia County is uniformly at risk to a hail event. Impacts typically include downed power lines and trees and damage to vehicles and mobile homes. Hail is a form of solid precipitation consisting of balls or irregular lumps of ice .5 millimeters or larger that form during certain thunderstorm conditions. In terms of extent for Volusia County, tennis ball-sized hail (2.5-inch diameter based on 22 AA hail conversions) has been observed on many occasions within Volusia County and is a probable occurrence on an annual basis. Larger hail conditions are less likely, but possible. The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hail and that future mitigation and adaptation strategies related to this hazard should be considered.

5.2.3 Historical Occurrences

According to the National Climatic Data Center, there have been 121 recorded hail events in Volusia County since 1777, as shown in **Table 5.3**¹. Hail has caused a total of \$221,002 in property damage, but has not resulted in any injuries or deaths. Hail sizes for these events range from 1.00 inches to 2.25 inches in diameter. The locations of historically recorded hail events are shown in **Figure 5.1**. The emergency management officials from the Volusia County jurisdictions determined that only hail that was greater than one inch in diameter was to be listed in **Table 5.3**.

¹ A Hail event that affects several jurisdictions on the same day is classified as a single event.

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Volusia County	11/16/2016	1.00	0	0	Not Available
Volusia County	2/22/2011	2.25	0	0	Not Available
Volusia County	11/22/2011	1.25	0	0	Not Available
Volusia County	5/22/2011	1.25	0	0	Not Available
Volusia County	4/4/2011	1.00	0	0	Not Available
Volusia County	6/10/2015	1.25	0	0	Not Available
Volusia County	5/12/2016	1.50	0	0	Not Available
Volusia County	4/1/2011	1.00	0	0	Not Available
Volusia County	4/22/2012	1.50	0	0	Not Available
Volusia County	4/22/2012	1.25	0	0	Not Available
Volusia County	6/22/2015	1.00	0	0	Not Available
Volusia County	6/1/2011	1.25	0	0	Not Available
Volusia County	5/24/2011	1.50	0	0	Not Available
Volusia County	2/21/2011	1.00	0	0	Not Available
Volusia County	11/22/2011	1.25	0	0	Not Available
Volusia County	5/1/2011	1.00	0	0	Not Available
Volusia County	6/26/2010	1.00	0	0	Not Available
Volusia County	5/22/2012	1.00	0	0	Not Available
Edgewater	1/11/2011	1.50	0	222,200	Strong downburst winds damaged 2 mobile homes. Most had aluminum awnings, carports, and family rooms ripped away. Trees and power lines were downed. Up to golf ball-sized hail also fell.
Daytona Beach	11/21/2011	1.25	0	0	Golf ball-sized hail fell at the Daytona Beach Airport.
Daytona Beach	6/1/2015	2.50	0	226,202	Severe thunderstorms blew down dozens of trees in Deltona and produced one inch-diameter hail.
Daytona Beach	11/22/2016	1.25	0	0	Strong downburst winds blew down trees destroyed a pool screen and produced two and one-half-inch-diameter hail in the Spruce Creek Village.
Barberville	6/15/2016	1.00	0	0	Hail the size of quarters fell in Barberville, while quarter-sized hail fell in Delary.
Delary	6/15/2016	1.00	0	0	
Daytona Beach	11/25/2016	1.00	0	0	Not Available

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Deltona	2/22/2012	1.00	0	0	Not Available
DeLary	2/21/2012	1.00	0	0	Not Available
Deltona	2/22/2012	1.00	0	0	Not Available
DeLand	2/20/2012	1.25	0	0	Not Available
New Smyrna Beach	2/20/2012	1.00	0	0	Not Available
Daytona Beach	6/25/2012	1.25	0	0	Not Available
Port Orange	1/22/2012	1.00	0	\$4,022	A few mobile homes were damaged by falling trees and quarter size hail in Port Orange.
Pierson	5/26/2012	1.25	0	0	Not Available
Orange City	5/22/2012	1.25	0	0	Not Available
Oak Hill	4/15/2000	1.00	0	0	Not Available
DeLand	2/1/2000	1.25	0	0	Not Available
Oak Hill	2/2/2001	1.00	0	0	Not Available
DeLand	2/21/2001	1.00	0	0	Not Available
New Smyrna Beach	2/21/2001	1.00	0	0	Not Available
Deltona	2/1/2002	1.00	0	0	Not Available
DeLand	4/25/2002	1.00	0	0	Not Available
DeLand	2/1/2002	1.00	0	0	Not Available
Oak Hill	2/21/2002	1.00	0	0	Not Available
DeLand	10/22/2002	1.00	0	0	Not Available
Port Orange	2/22/2004	2.00	0	0	Not Available
Maytown	10/1/2004	1.00	0	0	Not Available
Seville	2/25/2005	1.00	0	0	Not Available
Daytona Beach	5/4/2005	1.25	0	\$112,551	Not Available
Holly Hill	6/22/2006	1.25	0	0	Not Available
DeLand	2/1/2006	1.00	0	0	Not Available
Glencoe	2/22/2002	1.00	0	0	A cold front moving across central Florida produced a line of thunderstorms that moved southeast across the area. One inch hail was reported in Port Orange. Quarter size hail was reported at Interstate 25 and Highway SR44, near Glencoe, and in Daytona Beach. The public reported nickel size hail in Deltona.
Port Orange	2/22/2002	1.00	0	0	
Daytona Beach	2/22/2002	1.00	0	0	Quarter-sized hail was reported. A sea breeze thunderstorm produced hail and wind gusts in interior parts of E.C.F.
Seville	2/25/2002	1.00	0	0	

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Seville	6/1/2007	1.00	0	\$0	Numerous strong storms developed over east central Florida, with a few strengthening to severe levels and producing wind damage and large hail.
DeLeon Springs	7/11/2007	1.00	0	\$0	A northward-lifting warm front combined with active sea breeze boundaries within an unstable atmosphere produced several severe thunderstorms with nickel to quarter sized hail and localized severe winds.
Ponce Park	2/22/2010	1.00	0	\$0	Isolated thunderstorms developed in an unstable environment well ahead of a cold front. One of the storms became strong and produced small hail as it moved east out of the Ocala National Forest. The storm strengthened as it approached the coast, producing large hail on the barrier island east of central Daytona Beach.
Harbor Point	5/1/2011	1.00	0	\$0	The collision of the east and west coast sea breezes formed a broken line of thunderstorms across East Central Florida. A couple of these pulse storms became severe in Orange and Volusia Counties.
Ormond by the Sea	7/1/2011	1.00	0	\$0	A pre-frontal squall line moved rapidly across central Florida, bringing strong to severe thunderstorms with large hail and funnel clouds.
Glencoe	5/1/2012	1.25	0	\$0	The east coast sea breeze formed in the early afternoon and propagated inland, eventually colliding with the west coast sea breeze over the central peninsula. Storms moved to the east and northeast and produced large hail over DeLand and Volusia Counties.
Deltona	4/20/2012	1.25	0	\$0	Several severe thunderstorms occurred as low to mid-level southwest winds brought a warm and very moist air mass into east central Florida. Much cooler and drier air above this moisture laden air allowed for vigorous storm

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					development which acted to produce severe wind gusts and hail in many of the thunderstorms that developed.
Barberville	4/20/2012	1.25	0/0	\$0	Several severe thunderstorms occurred as low to mid-level southwest winds brought a warm and very moist air mass into east central Florida. Much cooler and drier air above this moisture laden air allowed for vigorous storm development which acted to produce severe wind gusts and hail in many of the thunderstorms that developed.
Deary	4/20/2012	1.00	0/0	\$0	Several severe thunderstorms occurred as low to mid-level southwest winds brought a warm and very moist air mass into east central Florida. Much cooler and drier air above this moisture laden air allowed for vigorous storm development which acted to produce severe wind gusts and hail in many of the thunderstorms that developed.
DeLand DeSteen Glencoe	5/1/2012	0.25 (DeLand) 0.22 (DeSteen) 1.25 (Glencoe)	0/0	\$0	The east coast sea breeze formed in the early afternoon and propagated inland, eventually colliding with the west coast sea breeze over the central peninsula. Storms moved to the ESE, producing large hail over Volusia County.
Daytona Airport	6/24/2014	0.22	0/0	\$0	A thunderstorm developed rapidly along the east coast sea breeze over coastal Volusia County and
DeLeon Springs	6/26/2014	0.22	0/0	\$0	A weather spotter observed hail up to nickel size in DeLeon Springs as a strong thunderstorm affected the area.
Deltona	5/20/2015	1.00	0/0	\$0	Strong thunderstorms developed over the mainland and became severe as they interacted with the east coast sea breeze over central Volusia and eastern Seminole County. Large hail, up to quarter-sized, was reported across sections of Deltona and Oviedo.
DeLeon Springs	2/6/2015	0.25	0/0	\$0	Thunderstorms developed along the west coast sea breeze and became

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					strong as they approached Volusia County, producing small hail and some minor tree damage in the Leon Springs.
the Leon Springs	6/6/2016	1.00	0/0	\$0	An isolated thunderstorm quickly became severe and hail up to quarter size as it moved slowly southeast across the Leon Springs.
Enterprise	2/15/2017	0.75	0/0	\$0	Scattered thunderstorms developed ahead of a strong cold front, bringing small hail to Enterprise in Volusia County.
Harbor Point the Smyrna Beach Enterprise	6/1/2017	1.00 to 1.25	0/0	\$0	A sea breeze collision produced a severe thunderstorm over east central Volusia county during the late afternoon. Several reports of quarter to half dollar sized hail were received from Port Orange to the Smyrna Beach.
Enterprise	7/20/2017	1.00	0/0	\$0	A collision of the east and west coast sea breezes over the interior of Central Florida produced two severe thunderstorms that resulted in quarter-sized hail in Orange and Volusia Counties. A funnel cloud was also reported in the Osceola County.
Ormond Beach the Leon Springs Daytona Beach Holly Hill	7/20/2017	1.00 to 2.00	0/0	\$0	A deepening mid-level trough and associated strong cold front moved across north-central Florida. Conditions ahead and along the cold front were favorable for severe thunderstorms as an 20-30 knot jet maxima produced sufficient upper level divergence. These conditions produced an enhanced risk of severe weather, sparking several rounds of severe thunderstorms, which affected Volusia, Seminole, Orange, DeLand and the Alachua Counties.
the Smyrna Beach	4/27/2017	0.75	0/0	\$0	An area of low pressure and a weak cold front moved across central Florida sparking numerous showers and thunderstorms across the area. Deep moisture was in place across the area,

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					and instability had increased through the day due to daytime heating. The instability, combined with lift associated with the approaching cold front and cold temperatures in the middle part of the atmosphere, allowed a few thunderstorms to become severe. In Volusia County, a strong storm produced nickel sized hail. In Seminole County, damaging winds caused numerous trees to be uprooted. In DeSoto County, a severe thunderstorm produced a strong wind gust at the Cape.
Deltona	5/24/2017	0.25 - 1.00	0/0	\$0	An area of high pressure located over the central Atlantic was the dominant feature affecting weather over central Florida. This led to west to southwest winds at the surface that pushed deep moisture from the Gulf across the area. Hot daytime temperatures, and cold temperatures in the middle atmosphere provided the necessary ingredients for strong to severe thunderstorms to develop. These storms developed along the sea breezes and outflow boundaries that were produced. One thunderstorm became severe in southwestern Volusia County where it produced hail and damaging winds.
Glencoe Hucomer	5/21/2017	0.25 - 1.00	0/0	\$0	The Atlantic high-pressure ridge located south of Florida resulted in southwest winds across central Florida. This pushed deep moisture over the area, and when combined with daytime heating and cold temperatures in the middle atmosphere provided the conditions for showers and thunderstorms to develop. One thunderstorm in eastern Volusia County interacted with the sea breeze front. This storm quickly became severe

SECTION 5: HAZARD PROFILES

TABLE 5.3: Historical Hail Impacts

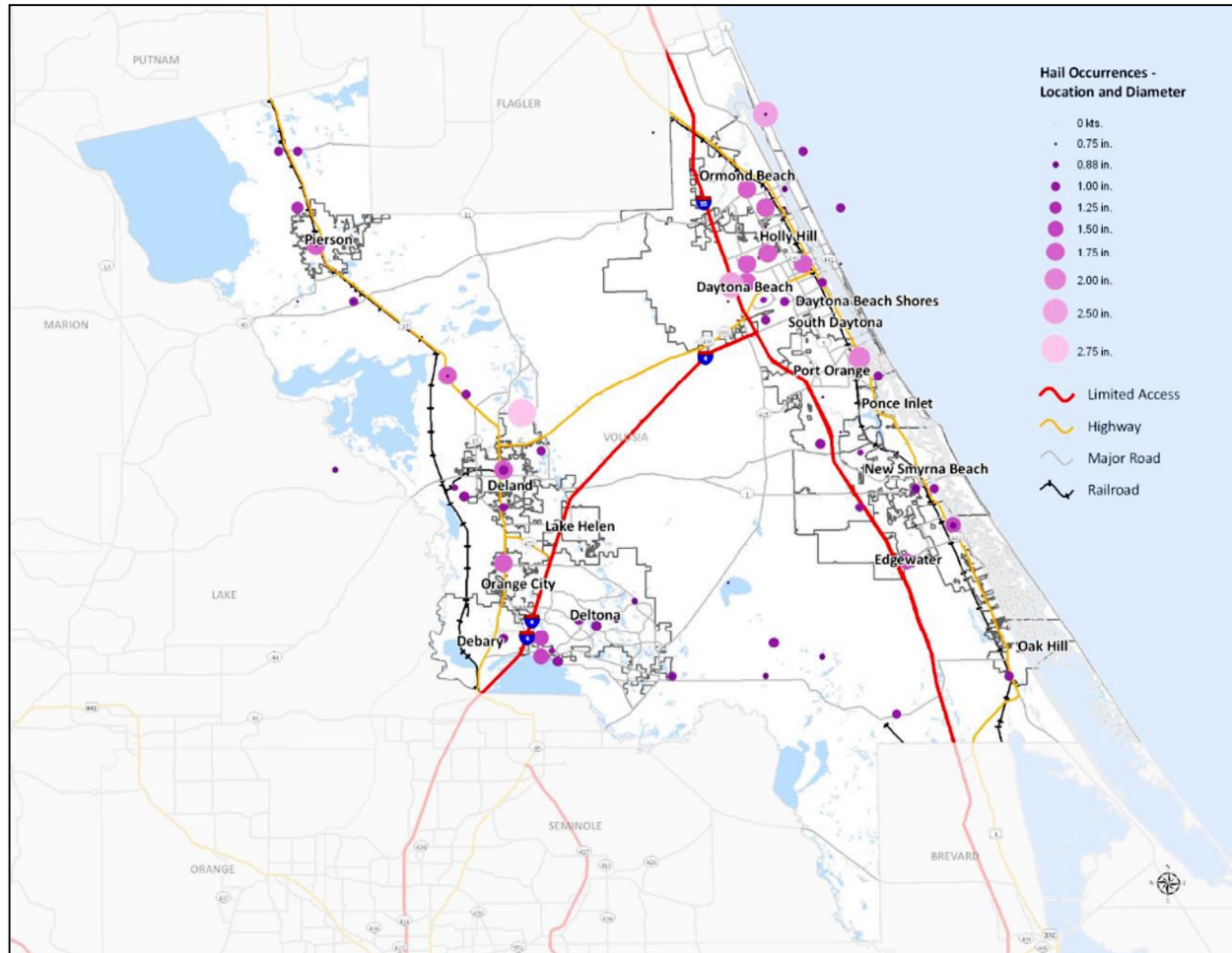
LOCATION	DATE	MAGNITUDE (inches)	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
					as it moved very slowly southward over New Smyrna Beach and Edgewater and several reports of hail were received in these areas.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER.

SECTION 5: HAZARD PROFILES

FIGURE 5.1: Locations of Historical Hail Events in Volusia County



Source: National Climatic Data Center

5.2.4 Probability of Future Occurrences

Based on the frequency of hail events in the past, the probability of future hail occurrences in Volusia County is high. Over the past 45 years, Volusia County has been impacted by two or more hail events per year. It can be expected that future hail events will continue to cause minor to severe damage to property and vehicles throughout Volusia County.

SECTION 5: HAZARD PROFILES

5.3 HURRICANE AND TROPICAL STORM

5.3.1 Background

Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 20 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with hurricanes and tropical storms are high-level sustained winds, heavy precipitation, and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September, and the average number of storms that reach hurricane intensity per year in this basin is about six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (**Table 5.4**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense².

TABLE 5.4: Saffir-Simpson Scale

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (MPH)	MINIMUM SURFACE PRESSURE (MILLIBARS)	STORM SURGE (FEET)
Tropical Storm	39-73	≤ 980	0-6
1	74-95	Greater than 980	1-5
2	96-110	980-965	6-8
3	111-129	964-945	9-12
4	130-155	944-920	13-18
5	156 or greater	Less than 920	18 or greater

Source: National Hurricane Center

² Although a tropical storm is not part of the Saffir-Simpson Scale, it is listed here for comparative purposes.

SECTION 5: HAZARD PROFILES

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as major hurricanes. Hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, but they account for over 80 percent of the damage in the United States. **Table 5.5** describes the damage that could be expected for a tropical storm and each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge and inland flooding associated with heavy rainfall that usually accompanies these storms.

TABLE 5.5: Hurricane Damage Classifications

STORM CATEGORY	DAMAGE LEVEL	WIND SPEED	DESCRIPTION OF DAMAGES	PHOTO EXAMPLE
Tropical Storm	MINOR	39-73 mph	Breaks twigs and branches off trees, damages signboards, and windows may break.	
1	MINIMAL	74-95 mph	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	96-110 mph	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	111-129 mph	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	130-156 mph	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	157+ mph	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Sources: National Hurricane Center; Federal Emergency Management Agency, Tropical Storm Photo: FEMA/George Armstrong; Other Photos: Pexels Photo Library

SECTION 5: HAZARD PROFILES

5.3.2 Location and Spatial Extent

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. Coastal areas are directly exposed to the brunt of a land-falling storm, but its impact is often felt hundreds of miles inland. Volusia County is susceptible to all of the hazards wrought by hurricanes and tropical storms. All areas throughout the county are susceptible to the accompanying hazard effects including extreme wind, flooding, and tornadoes. In addition, the coastal areas of the county are extremely susceptible to the added effects of storm surge, wave action, coastal erosion and tidal flooding³. This includes the cities and towns of *Ormond Beach*, *Holly Hill*, *Daytona Beach*, *South Daytona*, *Daytona Beach Shores*, *Port Orange*, *Ponce Inlet*, *New Smyrna Beach*, *Edgewater* and *Oak Hill*.

The extent of tropical systems in terms of strength in Volusia County is fairly consistent when reviewing historical data. Storms to hit the county are primarily in the Tropical Storm to Category 1 range, with winds seldom exceeding 75 miles per hour. Winds have exceeded 100 miles per hour (Category 2 range) just three times since 1860 in Volusia County.

5.3.3 Historical Occurrences

According to NOAA historical storm track records, 24 hurricane or tropical storm tracks have passed within 75 miles of Volusia County since 1850.⁴ This includes: zero (0) Category 5 hurricanes; three (3) Category 4 hurricanes; eight (8) Category 3 hurricanes; nine (9) Category 2 hurricanes; twenty-three (23) Category 1 hurricanes; and fifty-one (51) tropical storms. Of the recorded storm events, 25 had tracks that traversed directly through Volusia County. **Table 5.6** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 100 miles of Volusia County) and Category of the storm based on the Saffir-Simpson Scale. **Figure 5.3** shows the track of each recorded storm in relation to Volusia County and eastern Florida.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hurricanes that future mitigation and adaptation strategies related to this hazard should be considered.

TABLE 5.6: Historical Storm Tracks within 75 Miles of Volusia County (1850–2019)

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (MPH)	STORM CATEGORY
10/20/1941	Not Named	75	Tropical Storm
10/17/1944	Not Named	65	Category 1 Hurricane
06/24/1945	Not Named	70	Category 1 Hurricane
07/16/1945	Not Named	110	Category 1 Hurricane
10/27/1946	Not Named	40	Tropical Storm
11/22/1946	Not Named	75	Tropical Storm

³ Distinct hazard area locations for flooding, storm surge, and coastal erosion are discussed elsewhere in this section.

⁴ These storm track statistics do not include tropical depressions or extratropical storms. Though these related hazard events are less severe in intensity, they may indeed cause significant local impact in terms of rainfall and high winds.

SECTION 5: HAZARD PROFILES

TABLE 5.6: Historical Storm Tracks within 75 Miles of Volusia County (1850–2019)

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (MPH)	STORM CATEGORY
09/22/1842	Not Named	50	Tropical Storm
09/22/1846	Not Named	120	Category 4 Hurricane
09/06/1850	EAS	25	Category 2 Hurricane
10/12/1850	WING	25	Category 1 Hurricane
10/22/1852	HARREL	55	Tropical Storm
09/11/1860	WINDY A	105	Category 3 Hurricane
09/22/1864	CLE	25	Category 1 Hurricane
09/10/1864	WINDY A	100	Category 3 Hurricane
06/04/1862	ANDY	55	Tropical Storm
10/12/1862	GLADYS	20	Category 1 Hurricane
09/20/1876	WINDY	45	Tropical Storm
09/20/1877	ANDY	25	Category 2 Hurricane
09/04/1877	ANDY	25	Category 2 Hurricane
09/12/1871	WINDY	40	Tropical Storm
09/25/1877	ANDY	40	Tropical Storm
09/10/1874	WINDY A	60	Tropical Storm
09/22/1874	WINDY RE	45	Tropical Storm
09/24/1875	WINDY	60	Tropical Storm
10/10/1875	ISABEL	45	Tropical Storm
09/22/1877	CHRIS	40	Tropical Storm
11/22/1877	WINDY	55	Tropical Storm
11/12/1874	GRANDY	55	Tropical Storm
09/02/1875	ERI	25	Category 1 Hurricane
09/24/1875	JERRY	25	Tropical Storm
10/16/1877	IRENE	65	Category 1 Hurricane
09/14/2001	GABRIELLE	60	Tropical Storm
09/12/2004	CHARLE	125	Category 4 Hurricane
09/05/2004	FRAUCES	20	Category 1 Hurricane
09/26/2004	JEAFFE	25	Category 2 Hurricane
10/05/2005	TAMM	45	Tropical Storm
09/21/2002	FA	45	Tropical Storm
10/26/2012	SANDY	42	Tropical Storm
06/06/2016	CLIP	45	Tropical Storm
10/06/2016	MATTHEW	24	Category 1 Hurricane
09/10/2016	IRMA	62	Category 1 Hurricane
09/02/2012	WINDY	45	Tropical Storm

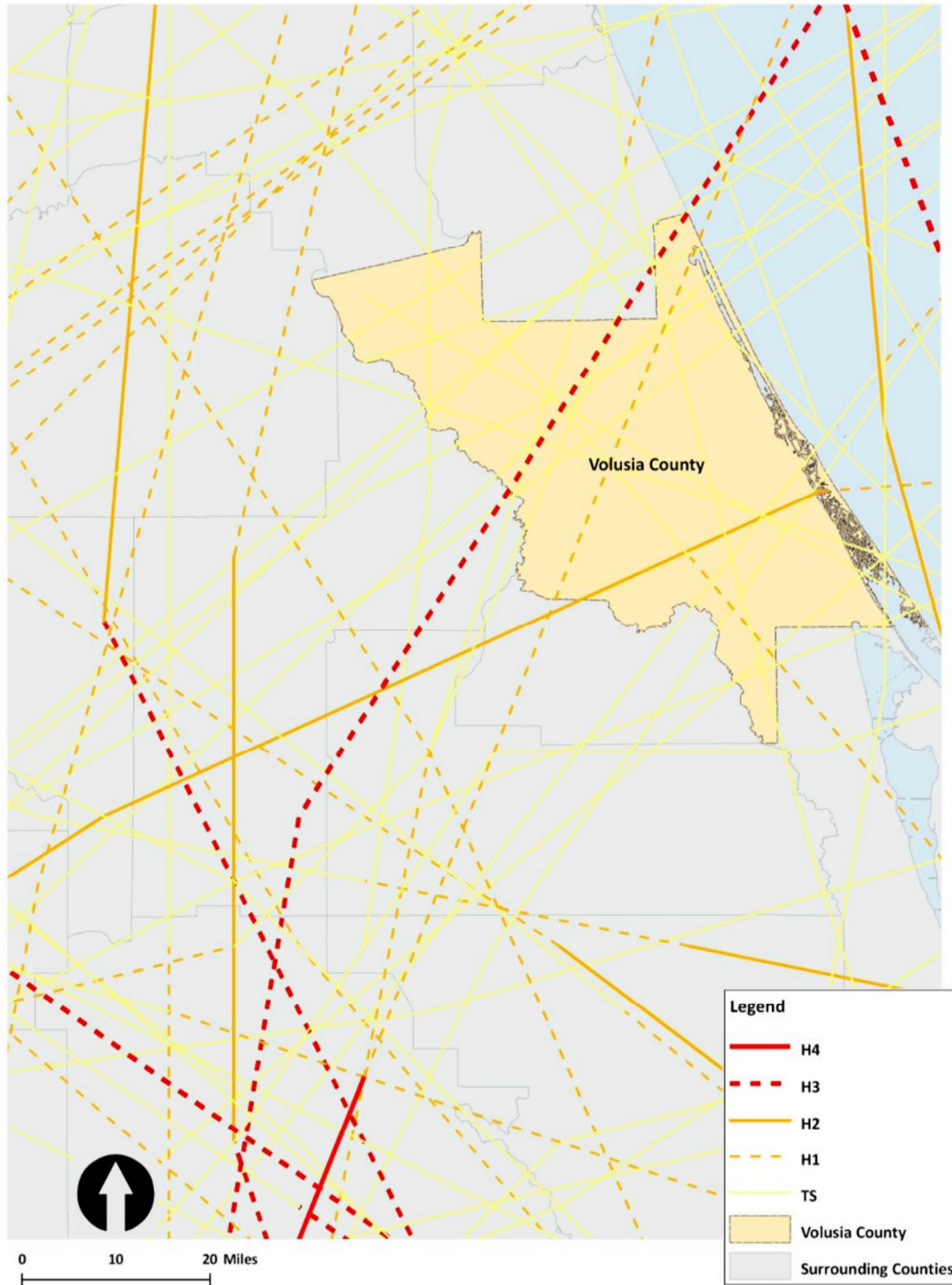
Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS DOCUMENTED BY THE NATIONAL CLIMATIC DATA CENTER. PLEASE NOTE THAT THESE OCCURRENCES ALSO SERVE AS HISTORICAL DATA FOR STORM SURGE OCCURRENCES.

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FIGURE 5.2: Historical Storm Tracks within 75 Miles of Volusia County

Source: National Oceanic and Atmospheric Administration



SECTION 5: HAZARD PROFILES

Some of the notable tropical cyclone events that occurred in Volusia County within the last two decades are described below:

Tropical Storm Gordon, 1994: Tropical Storm Gordon made landfall in South Florida on November 12, 1994. Gordon caused a total of 2 deaths, 42 injuries, and \$400 million in damages (\$605,222,252; 2002 dollars). It affected a number of Florida Counties, including Brevard and Volusia, but Volusia was hit especially hard. Volusia County experienced \$500,000 in both agricultural and property damage. Single-family, multi-family, and mobile home structures (a total of 1226 units) reported flood damage and losses were estimated at over \$26 million.

Hurricane Floyd, 1999: On September 15, 1999, the center of Hurricane Floyd passed about 115 statute miles off the coast of Central Florida, causing substantial damage to the coastal counties of Brevard and Volusia. Winds gusts near 20 miles per hour were reported in both counties. In total, Floyd caused over \$61 million in property damage, but there were no reports of deaths or injuries (\$21,222,222; 2002 dollars). Over \$42 million in damages were reported in Volusia County, \$10 million of which was attributed directly to coastal erosion. In addition, over 200 homes were damaged from wind and trees.

Hurricane Irene, 1999: Hurricane Irene reached hurricane status over the Florida Straits and the calm of the center moved over Key West on October 15, 1999. Most of the hurricane force winds were confined to the east of Irene's center over the lower to middle Keys. As Hurricane Irene moved across Southeast Florida, it brought tropical storm conditions with sustained winds between 22 and 22 miles per hour. Hurricane Irene caused considerable damage in South Florida due to flooding. In some residential areas, flooding lasted for a week, displacing several hundred people and isolating thousands more. Volusia County estimated that damages to approximately 125 properties; totaling more than \$16.2 million. The total losses (agricultural and property) were estimated near \$200 millions in of the state of Florida. An estimated 200,000 customers lost electricity. There were eight indirect deaths reported in Florida.

Hurricane Charley, 2004: Hurricane Charley produced wind gusts over 20 miles per hour as it traversed Volusia County on August 13, 2004. The storm caused over \$106 million in property damages in Volusia County. In addition, two fatalities were attributed to Hurricane Charley. Widespread power outages, roadway flooding, and fallen trees also occurred. A strong F1 tornado also touched down in South Daytona Beach contributing to the total damage from the event.

Hurricane Frances, 2004: Hurricane Frances, a Category 2 storm, made landfall on September 4, 2004 in Martin County, Florida. As it moved north, Volusia County experienced hurricane force wind for several hours. Daytona Beach International Airport recorded wind gusts of 24 miles per hour. In addition to wind impacts, over 12 inches of rain fell in Volusia County which caused substantial flooding. Wind and flooding impacts resulted in damages of over \$220 million within Volusia County. Total damage estimates for all impacted counties include over \$4.2 billion for property damage and \$22.2 million for crop damage. Despite widespread and severe damage, no deaths or injuries were reported.

Hurricane Jeanne, 2004: Hurricane Jeanne made landfall on the east coast of Florida on September 26, 2004, with winds estimated at 120 mph. Wide spread rainfall of up to eight inches accompanied Hurricane Jeanne as it moved across eastern, central and northern Florida. A narrower band of 11 to 12 inches was observed in the vicinity of the eye wall track over Osceola, Broward and Indian River counties of east central Florida. A storm surge of approximately four feet above normal astronomical tide levels was measured at Trident Pier at Port Canaveral, Florida about an hour after landfall. Storm surge

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flooding of up to six feet above normal tides likely occurred along the Florida east coast from the vicinity of Melbourne southward to Ft. Pierce. Damages were estimated to be over \$50 million in Volusia County. The American Insurance Service Group reported that Frances caused a total of \$4.11 billion in Florida. There were three direct deaths reported in Florida, with total deaths exceeding 2,000.

Tropical Storm Fay, 2008: Moving over Key West, Tropical Storm Fay made its first Florida landfall on August 12, 2008. As the tropical storm drifted north in the Volusia County off shore waters, hours of heavy rain fell across southern Volusia County. Tropical Storm Fay's primary impact was inland flooding. Rainfall amounts ranged from three to five inches over Miami-Dade and Broward counties and seven to 10 inches over northern Collier, Hendry and Glades counties near the center path of Fay. Storm surges were relatively minimal for this tropical storm. In Florida, wind damage was confined to mostly downed trees and power lines, plus minor roof damage to homes. Homes, personal property and motor vehicles were the primary damage losses in the United States. Volusia County reported damages in excess of \$12.5 million. The total damage estimate, compiled by the Property Claim Services, is \$245 million, including \$125 million in Florida. Flood damage losses reported by the National Flood Insurance Program were about \$26 million.

Tropical Storm Sandy, 2012: A New Smyrna Beach mesonet site (NWSB) recorded sustained north winds of 42 mph and other spotter reports confirmed tropical storm winds along the immediate coast of Volusia County. Gusts of 50-55 mph occurred, especially during passing squalls. Hurricane Sandy moved slowly northwest, parallel to the Florida Coast, approximately 200-250 miles offshore.

Hurricane Matthew, 2016: Matthew paralleled the Florida coast, remaining just offshore as a Category 2 hurricane. The eye reached its closest point of approach to land, only 25 miles east of Cape Canaveral near 0200LST on October 2, and was 25 miles east of Daytona Beach around 1100LST, as it continued moving northwest, just offshore the northeast Florida coast. Hurricane force winds (sustained or frequent gusts) affected coastal areas from Vero Beach northward, extending inland across the mainland portions of Brevard and Volusia Counties, with tropical storm force winds experienced across much of the remainder of east-central Florida.

Hurricane Irma, 2017: Hurricane Irma made a northerly turn toward Florida on Sunday, September 10. Hurricane Irma had maximum sustained winds of 125 MPH at its peak in the Atlantic Ocean, which it maintained for over 25 hours, making it one of the strongest storms on record in the Atlantic basin. Making its second continental U.S. landfall, Irma slowly weakened as it continued north-northwestward across north Florida and southwest Georgia through Monday September 11.

Hurricane Dorian, 2019: On September 1, Dorian reached Category 5 intensity, with maximum sustained winds of 125 mph, and a maximum central pressure of 910 mb (26.82 inHg) while making landfall in Elbow Cay, Bahamas. Dorian made another landfall on Grand Bahama several hours later. The ridge of high pressure steering Dorian westward collapsed on September 2, causing Dorian to stall just north of Grand Bahama for about a day. It is the strongest known system to impact the Bahamas. A combination of cold water upwelling and an eyewall replacement cycle weakened Dorian to a Category 2 hurricane on the next day. On the morning of September 2, Dorian began to move slowly towards the north-northwest.

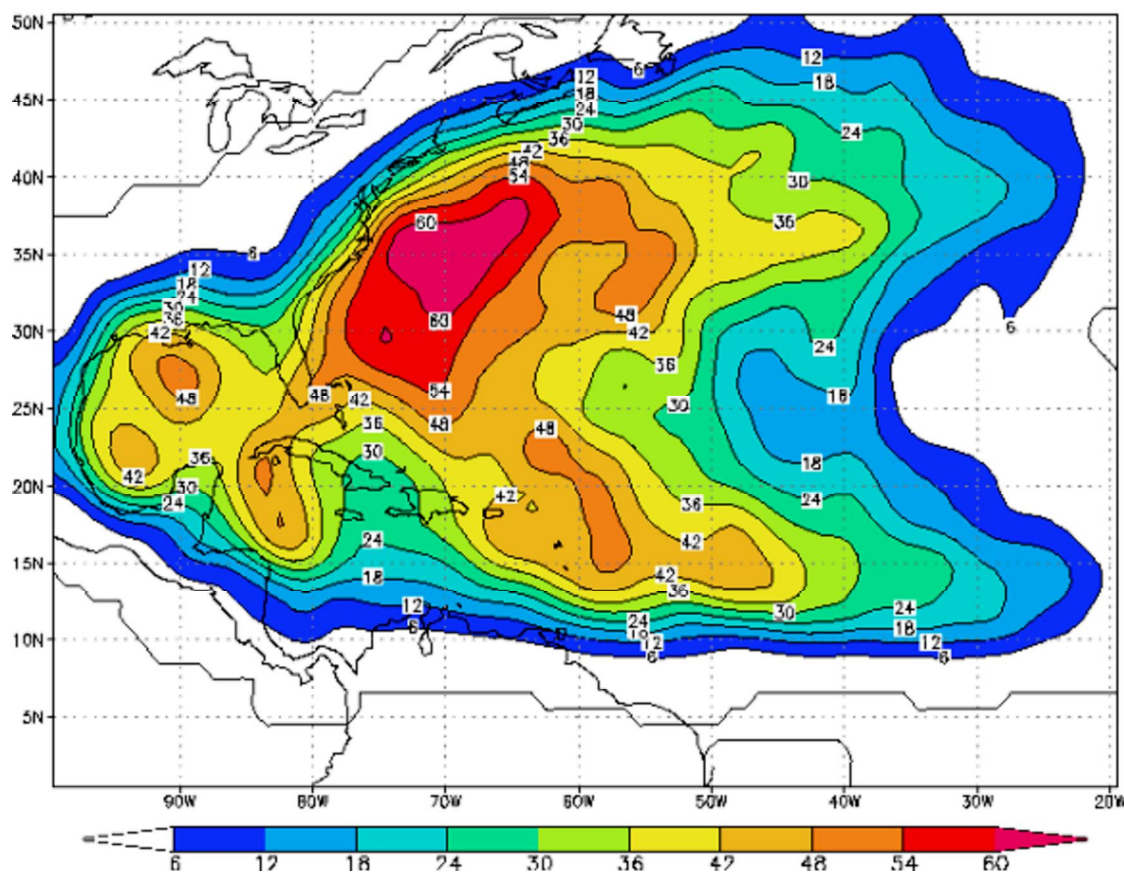
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5.2.4 Probability of Future Occurrences

The probability of future hurricane and tropical storm events for Volusia County is high. According to NOAA statistical data, Volusia County is located in an area with an annual probability of a named storm between 26 and 42 percent.

Figure 5.2 shows for any particular location what the chance is that a tropical storm or hurricane will affect the area sometime during the Atlantic hurricane season. This illustration was created by NOAA's Hurricane Research Division using data from 1944 to 1999 and counting hits when a storm or hurricane was within approximately 100 miles (165 km) of each location.

FIGURE 5.2: Empirical Probability of a Named Hurricane or Tropical Storm



Source: National Oceanic and Atmospheric Administration

The probability of storm occurrences will vary significantly based on the return interval for different categories of magnitude. The probability of less intense storms (lower return periods) is higher than more intense storms (higher return periods). Table 5.2 profiles the average potential peak gust wind speeds for each jurisdiction that can be expected in Volusia County during a hurricane event for various return periods according to FEMA's HAZUS-MH.

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TABLE 5.7: Average Peak Gust Wind Speeds (MPH) vs. Return Period

JURISDICTION	10-YEAR	20-YEAR	50-YEAR	100-YEAR	200-YEAR	500-YEAR	1,000-YEAR
Daytona Beach	70.7	74.2	100.0	110.7	120.2	120.7	122.7
Daytona Beach Shores	71.7	75.4	101.4	112.7	121.7	122.4	140.7
Deary	62.4	72.7	77.6	102.6	116.5	125.7	122.6
DeLand	62.0	71.7	77.0	102.2	116.0	125.7	122.0
Deltona	62.7	72.6	77.2	102.6	112.6	126.7	122.7
Edgewater	71.7	75.6	101.7	112.2	121.5	121.5	122.7
Holly Hill	70.7	74.2	77.7	110.2	112.7	120.7	122.7
Lake Helen	62.6	72.7	77.7	102.7	112.4	126.7	122.6
New Smyrna Beach	72.0	75.7	101.7	112.4	121.7	121.7	122.4
Pak Hill	72.1	72.0	102.7	114.0	122.4	122.7	140.7
Range City	62.2	72.1	77.7	102.4	116.7	125.7	122.4
Armond Beach	70.5	74.0	77.5	110.2	112.7	120.6	122.4
Pierson	62.5	70.2	75.2	105.0	112.4	122.5	120.2
Ponce Inlet	71.7	75.5	101.6	112.7	121.7	122.0	140.0
Port Orange	71.2	74.7	100.5	111.4	120.7	121.0	122.7
South Daytona	71.2	74.7	100.6	111.4	120.7	121.7	122.2
Unincorporated	70.7	72.6	77.1	102.6	112.7	122.7	126.2

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from wind that future mitigation and adaptation strategies related to this hazard should be considered.

SECTION 5: HAZARD PROFILES

5.4 LIGHTNING

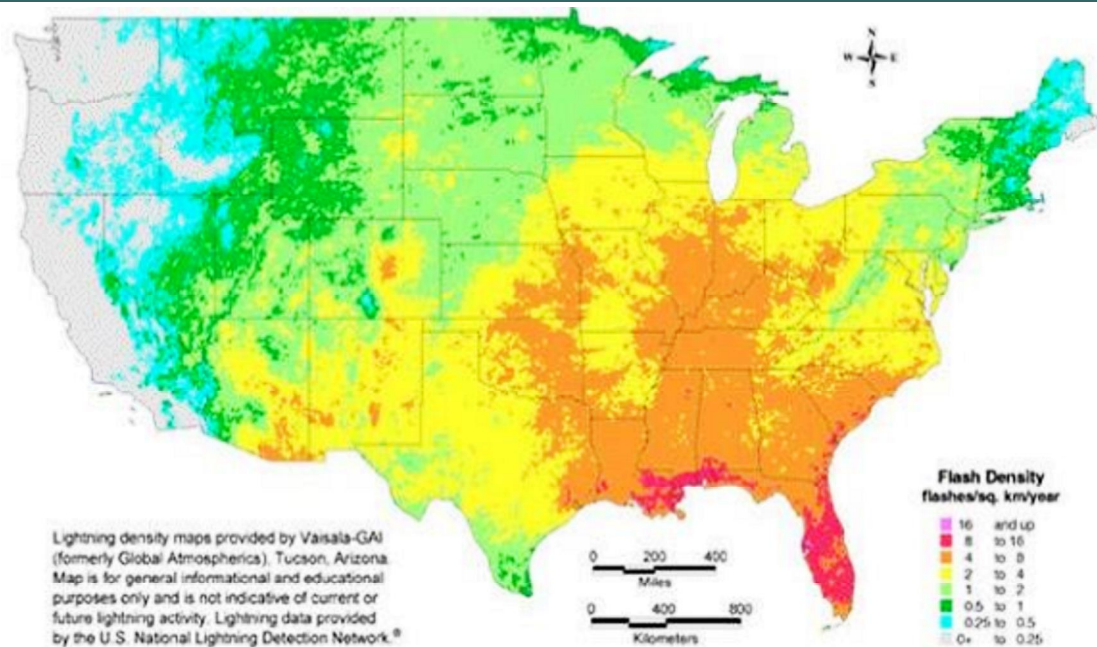
5.4.1 Background

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to FEMA, an average of 200 people is injured and 20 people are killed in the United States each year by lightning. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire⁵.

Volusia County is located in a region of the country that is particularly susceptible to lightning. **Figure 5.4** shows a lightning flash density map for the years 1996-2000 based upon data provided by Vaisala’s U.S. National Lightning Detection Network (NLDN[®]).

FIGURE 5.5: Lightning Flash Density in the United States



Source: Vaisala U.S. National Lightning Detection Network

Wildfires are section 5.14.

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5.4.2 Location and Spatial Extent

Lightning occurs randomly and is, therefore, impossible to predict where it will strike. It is assumed that all of Volusia County is uniformly exposed to lightning which strikes in very small, specific geographic areas. Impacts from lightning have included deaths and injuries, damage to electrical systems, and fires that have destroyed residential and commercial property.

5.4.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of 11 recorded lightning events in Volusia County since 2010 that resulted in \$425,000 in damages, as listed in **Table 5.8**. However, these are only the lightning events that have been reported to NOAA. According to the emergency managers from various Volusia County jurisdictions thousands of lightning strikes occur each day during the summer afternoon thunderstorms. For example, in 1999 the Port Orange Police Department was struck by lightning twice in a two-week period, each time knocking out the 111 consoles. In addition, during September 2002, there was a lightning event that occurred in Port Orange causing damages totaling \$10,000 to a property which had an appraisal value of \$50,000 and another which occurred in August 2002, in Deary causing damages of \$500,000 to a church which had burned to the ground. Volusia has the second greatest number of lightning strikes in Florida, behind the Tampa Bay area. The corridor between I-25 and I-95 in the North Central Florida area experiences a high number of lightning strikes. **Table 5.8** is merely a sample of the lightning strikes that have occurred in the county.

TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2002 dollars)	DESCRIPTION
Holly Hill	8/22/2014	0/1	\$0	A 12-year-old male riding a bike was hospitalized with burns to his chest after lightning struck the boy.
New Smyrna Beach	7/1/2014	1/1	\$0	A fast-moving thunderstorm, which had produced rain for only a few minutes, produced the flash which struck the victims directly. One death and one injury resulted.
New Smyrna Beach	6/24/2015	0/1	\$0	A lifeguard on top of a high observation tower was struck and injured by lightning.
Ormond Beach	6/22/2015	0/1	\$0	A woman was injured by lightning while talking on a telephone in her home.
Daytona Beach	8/22/2015	1/1	\$0	Two men were struck by a lone lightning bolt. Both men were hospitalized in critical condition. One of the two died three days later.
Deary	6/15/2016	0/0	\$225,000	Fires started by lightning destroyed two condominiums.
New Smyrna Beach	6/1/2016	0/0	\$100,000	Fire started by lightning severely damaged a house.

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TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2002 dollars)	DESCRIPTION
Edgewater	2/20/2001	0/1	\$0	Lightning knocked a plumber unconscious while he was under a mobile home.
New Smyrna Beach	2/21/2001	0/0	\$4,000	A Volusia County Sheriff's Office horse was killed by lightning while standing under a tree.
Daytona Beach	2/4/2002	0/0	\$24,500	Lightning started a fire that damaged an apartment building in Daytona Beach.
Daytona Beach	2/4/2002	0/2	\$0	Eight spectators were struck and injured by lightning at Daytona Beach International Speedway. Two of the victims were hospitalized. Six were treated and released at the scene.
Port Orange	2/22/2002	1/0	\$0	A 62-year-old man was killed by lightning outside his home.
Edgewater	2/20/2002	0/0	\$12,440	Lightning started a fire that damaged a carpet store in Edgewater.
Lake Hill	2/21/2002	0/0	\$25,220	Fire started by lightning destroyed a mobile home.
Deltona	2/25/2002	0/0	\$222,510	Fire from a lightning strike destroyed a church in Deltona.
Port Orange	2/14/2002	0/0	\$222,510	Lightning struck a warehouse in Port Orange.
Daytona Beach	6/22/2004	0/2	\$0	Two spectators suffered minor injuries from a lightning strike at Daytona Beach International Speedway.
Pierson	2/22/2004	0/2	\$0	Two convenience store workers were briefly hospitalized after being injured by a lightning strike while working in the store kitchen.
Edgewater	5/24/2005	0/1	\$0	A 22-year-old man was seriously injured by lightning while in a wooded area near Edgewater.
DeLand	2/22/2005	0/0	\$0	Lightning strikes downed trees and power lines in DeLand.
DeFary	5/26/2006	0/1	\$0	A woman carrying a child outside was struck by lightning. The child was uninjured. The woman was transported to a hospital in critical condition.
Deltona	6/25/2007	0/0	\$26,520	Lightning heavily damaged a home in Deltona.
Ponce Park	2/12/2007	0/2	\$0	A small boat was struck by lightning in the Halifax River, resulting in minor injuries for two people.
DeFary	2/16/2007	0/0	\$4,120	Lightning ignited a barn fire near DeFary.
DeFary	2/16/2007	0/0	\$500,000	A lightning strike from an intense

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TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2000 dollars)	DESCRIPTION
				thunderstorm started a fire with burned a church to the ground.
Holly Hill	2/24/2002	0/1	20	Sea breeze boundaries collided over coastal Volusia County, resulting in the rapid development of a severe storm near Ormond Beach. This cell then back-built south-southwest along a boundary during the late afternoon, producing a complex of strong to severe cells farther inland. A waterspout developed within the initial severe cell offshore of Ormond Beach and moved onto the beach as a tornado, reaching the adjacent backyard of several homes just beyond the beach. This vortex meandered south along the beach and near-shore Atlantic waters for about ten minutes. Early in the evening, another tornado (EF-0) developed inland over Port Orange and damaged 150 mobile homes before lifting.
Daytona Beach	2/05/2002	0/1	20	Strong thunderstorms produced frequent cloud to ground lightning strikes across Volusia County. Two individuals were injured by lightning strikes in separate incidents about 20 minutes apart within Daytona Beach.
South Peninsula	2/05/2002	0/1	20	Strong thunderstorms produced frequent cloud to ground lightning strikes across Volusia County. Two individuals were injured by lightning strikes in separate incidents about 20 minutes apart within Daytona Beach.
Deary	2/20/2002	0/0	24,000	Sea breeze thunderstorms produced lightning across central Florida. Lightning ignited a barn fire near Deary.
Lake	6/22/2015	0/1	20	Lightning associated with thunderstorms developing along the east coast sea breeze injured a boy fishing in the water at Daytona Beach Shores.
Harbor Point	6/26/2015	1/0	20	Thunderstorms developed over northern Volusia County along the east coast sea breeze. Lightning struck and killed a 25-year-old male in Port Orange as he worked outdoors.
Lake	6/24/2016	1/2	20	Lightning from a thunderstorm located about 4 miles to the north struck a woman walking at waters edge on Daytona Beach Shores,

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TABLE 5.8: Historical Lightning Occurrences

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2002 dollars)	DESCRIPTION
				resulting in a fatality.
Ponce Park	7/14/2016	0/1	\$0	A severe thunderstorm produced wind damage to trees and structures in Lake County during the middle of the afternoon. About an hour later, another storm produced lightning which injured a man on a Volusia County beach.
Ellison Acres	1/22/2017	0/1	\$0	A line of strong thunderstorms moved quickly east across Volusia County early in the morning, crossing Ponce Inlet prior to sunrise. A fisherman on the north jetty was injured when lightning struck his fishing pole.
Armond by the Sea	2/22/2017	0/1	\$0	Lightning struck close to a woman standing in shallow water in Armond by the Sea, resulting in injuries.
Maytown	2/5/2017	0/0	\$200,000	An afternoon thunderstorm produced a lightning strike that hit a house in Oak Hill. The house caught fire and suffered extensive damage. No injuries or fatalities were reported.
Ellison Acres	6/14/2017	0/2	\$0	Numerous showers and thunderstorms developed along the collision of the east and west coast sea breeze in eastern Orange and eastern Seminole County. One storm became strong and produced penny sized hail just east of Geneva. Then, as these storms pushed east towards the coast, one storm produced a lightning strike that injured three people that were near the edge of the boardwalk in New Smyrna Beach.
Harbor Point	6/21/2017	0/0	\$25,000	This storm produced a severe wind gust in Melbourne Beach. In Port Orange, a home was destroyed after being struck by lightning and catching fire.
DeLand	7/2/2017	0/1	\$0	A woman standing in a parking lot in DeLand was struck and seriously injured by a lightning strike.
Armond Beach	6/2/2017	1/0	\$0	A motorcyclist was killed when he was struck by lightning while on Interstate 95 in Volusia County.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS AVAILABLE
 FROM THE NATIONAL CLIMATIC DATA CENTER

SECTION 5: HAZARD PROFILES**5.4.4 Probability of Future Occurrences**

The probability of occurrence for future lightning events in Volusia County is high. According to NOAA, Volusia County is located in an area of the country that experiences 7-16 lightning flashes per square kilometer per year (approximately 20,224 to 40,448 flashes countywide per year). Given this regular frequency of occurrence, it can be expected that future lightning events will continue to threaten life and property throughout Volusia County. The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hurricanes that future mitigation and adaptation strategies related to this hazard should be considered.

SECTION 5: HAZARD PROFILES

5.5 SEVERE WINTER STORM

5.5.1 Background

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. It may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings. All winter storm events have the potential to present dangerous conditions to Volusia County. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 or more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least three hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm.

Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice-pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. All of the winter storm elements – snow, low temperatures, sleet, ice, etc- have the potential to cause significant hazard to a community. Even small accumulations can down power lines and trees limbs and create hazardous driving conditions. Severe winter storms affect the entire county uniformly, as these are typically not localized events in Florida.

5.5.2 Location and Spatial Extent

Early the entire continental United States is susceptible to winter storms, but the degree of exposure typically depends on the normal expected severity of local winter weather. Volusia County, being in the southern portion of the nation, rarely experiences winter weather events, and thus has a much lower risk than more northern areas of the country. Typically, there have not been many winter storms that have caused damage in Volusia County. However, there were two severe winter storms that killed many of the orange groves in the 1900s. Future impacts throughout Volusia County could include damage to crops, nurseries and tree farms (e.g., Pierson is the fern capital of the world), and other vegetation; sleet could increase the number of vehicular accidents; and the increased use of alternate heating sources in homes could cause potential structural fires. Also, agriculture may be disproportionately affected.

A severe winter storm occurs when the surface air temperature is expected to be 22°F or below over a widespread area for at least 2 or more consecutive days (this is the minimum extent of a severe winter storm). Use of the term is usually restricted to aversive situations or occasions when wind or other conditions prevent frost. "chilling" may be used during the growing season when the temperature is expected to be low enough for a sufficient duration to kill all but the hardiest herbaceous crops. Extreme cold can immobilize an entire region. Even areas, such as Volusia County, that normally

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experience mild winters can be hit with a major extreme cold winter event. Winter storms can result in ice, localized flooding, closed highways, and blocked roads, downed power lines and hypothermia.

There is a low probability that Volusia County will experience 12 consecutive hours of temperatures below 22°F on an annual basis. However, outlier storms (such as the *Great Blizzard of 1899*) have been observed within Volusia County and are often the result of arctic activity that affects the entire North American continent. These events are of low probability on an annual basis but can occur.

Volusia County is more likely to experience freezing temperatures for much shorter durations of time. More specifically, temperatures tend to dip below the freezing threshold during night time from the months of November to February.

However freezing temperatures are not likely to persist for more than 24 hours at a time. In most circumstances, temperatures will only dip below freezing for a small number of hours during the night time. A number of these events were reported in Volusia County in the 2014- and 2015-time frame, one of the most recent and severe being the "polar vortex" super storm on January 6th and 7th, 2014. Although temperatures dipped to freezing levels during this event, highs in the 50s were reported in Volusia and throughout Central Florida during the day time.

Temperatures within Volusia County, Florida were recorded as low as 6 degrees Fahrenheit in December 1962, according to the National Oceanographic and Atmospheric Administration. Temperatures dropped to 6 degrees for five consecutive days, although the temperature did not sustain at this level continuously. These temperatures can be experienced in the future in Volusia County, Florida.

5.5.3 Historical Occurrences

Despite the rare chance of winter storm occurrence, one snow event was reported in 2007 according to NOAA. On January 2, 2007, cold breezes off the Atlantic produced brief snow flurries along the coast of Volusia County. On January 2, 2010 sleet was reported in Volusia County. According to an Emergency Operations Management Volusia County manager, there were also two severe winter freezes in the mid to late 2000s. These events killed many orange groves in Volusia County and around the state. There were no reports of death, injuries, or property damage as a result of the winter weather. Also, in 1999, a rare blizzard struck the state of Florida, inundating much of the state in up to one-foot of snow. There are no official historic occurrences of this hazard on the National Climatic Data Center web database.

5.5.4 Probability of Future Occurrences

There is a low probability of future winter storm occurrences in Volusia County; however, outlier storms such as the 1999 blizzard can occur with an extremely low probability. Winter storm events will remain an infrequent occurrence in Volusia County. Given the average winter temperature of 61.5 degrees Fahrenheit, it is highly unlikely that a winter event beyond light snow will occur.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hail and that future mitigation and adaptation strategies related to this hazard should be considered.

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5.6 Thunderstorm

5.6.1 Background

Thunderstorms are common throughout Florida and occur throughout the year. Although thunderstorms generally affect a small area, they are very dangerous given their ability to produce accompanying hazards including high winds, hail, and lightning which all may cause serious injury or death, in addition to property damage⁶.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as severe. A severe thunderstorm occurs when the storm produces one of three elements: 1) Hail of three-quarters of an inch; 2) Tornado; 3) Winds of at least 58 miles per hour.

Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the "engine" of the storm). Finally, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun's heat. When these conditions occur, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Further, they can move through an area very quickly or linger for several hours.

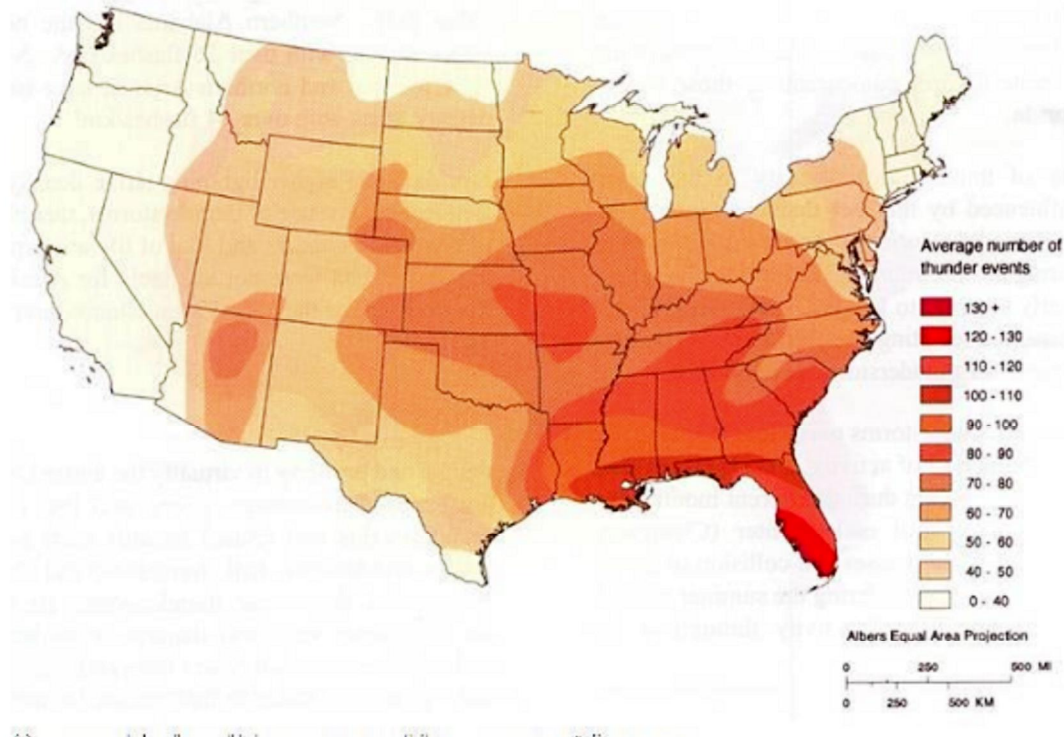
Severe weather has the ability to affect all jurisdictions within Volusia County and their duration can span from localized events (less than 10 minutes locally) to hours-long events (primarily in the case of hurricanes or large tropical systems). Please reference the table that depicts thunderstorm days per year for a scope on the annual average number of thunderstorm events per year. This table depicts the relatively high risk that Florida faces as compared to the rest of the United States. Lightning incidence within Central Florida is among the heaviest in the world; the only other comparable areas include tropical areas of Africa in terms of lightning strike density. Please reference the lightning map within this report.

The National Weather Service collected data for thunder events and lightning strike density for the 20-year period from 1947 to 1966. A series of maps were generated showing the annual average thunder event duration, the annual average number of thunder events and the mean annual density of lightning strikes. **Figure 5.5** illustrates thunderstorm hazard severity based on the annual average number of thunder events from 1947 to 1966. Volusia County falls into the range of an average of 110 to 120 thunderstorm events annually.

¹ Lightning and Hail are discussed in detail as separate hazards in this section.

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Figure 5.5: Average Annual Number of Thunder Events



Source: Federal Emergency Management Agency

5.2 Location and Spatial Extent

Severe thunderstorms and their related hazardous elements (including lightning, hail, and straight-line winds) are not confined to any geographical boundaries and typically are widespread events (**Figure 5.5**). Further, while thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. Therefore, it is assumed that Volusia County would be uniformly exposed to these hazards and that the spatial extent of that impact would potentially be large. The extent of thunderstorm severity varies on an event-by-event-basis and is generally subject to the atmospheric conditions present at the time. While light thunderstorms are more common in frequency, severe thunderstorms (with associated Severe Thunderstorm Warnings) which include the added impacts of lightning and (more rarely) hail occur several times per year in Volusia County.

5. Historical Occurrence

According to the National Climatic Data Center, Volusia County has experienced approximately 125 thunderstorm events since 1950. Further, 24 of these thunderstorm events resulted in property damage totaling over \$2.5 million. **Table 5.** shows historic thunderstorm events, including thunderstorm winds and high winds, which resulted in property damage in Volusia County. (Other windstorms, such as tornadoes and hurricanes, are addressed separately in this section.) In addition to property damage, these severe thunderstorm events resulted in two injuries and over \$20,000 in crop damage.

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2000 Dollars)	DESCRIPTION
Pierson	2/22/2000	Thunderstorm Winds	0/0	\$12,502	Severe thunderstorm winds blew down trees on a house near Pierson.
Deltona	2/26/2000	Thunderstorm Winds	0/1	\$15,652	Thunderstorm winds blew down power lines and trees in the Deltona Area. One woman was injured when a tree fell on her car as she was driving in Deltona.
Orange City	2/20/2000	Thunderstorm Winds	0/0	\$22,142	Thunderstorm winds blew down numerous trees and power lines in Orange City. Falling trees damaged six residences.
Emporia	2/04/2000	Thunderstorm Winds	0/0	\$12,042	Thunderstorm winds blew down a large shed cover at a fern nursery.
Daytona Beach	2/12/2001	Thunderstorm Winds	0/1	\$22,002	Strong microburst winds hit the barrier island in Daytona Beach destroying a large tent and a beach tollbooth. One person was injured.
Daytona Beach	6/16/2001	Thunderstorm Winds	0/0	\$12,002	Thunderstorm winds blew a 50 foot section off the roof of a restaurant in Daytona Beach.
New Smyrna Beach	2/21/2001	Thunderstorm Winds	0/0	\$20,262	Thunderstorm winds swept across the New Smyrna Beach Airport overturning a small plane and damaging six others.
DeBary	2/05/2002	Thunderstorm Winds	0/0	\$12,222	Thunderstorm winds blew down trees on a mobile home in DeBary.
Deltona	2/20/2002	Thunderstorm Winds	0/0	\$1,124	Thunderstorm winds blew down numerous trees and power lines in Deltona.
Deltona	2/21/2002	Thunderstorm Winds	0/0	\$112,405	Strong thunderstorm winds swept across the Deltona area blowing down dozens of trees that damaged houses and vehicles.
Holly Hill	2/12/2002	Thunderstorm Winds	0/0	\$21,422	Thunderstorm winds destroyed a large gas station roof awning in Holly Hill.
DeSteen	4/20/2004	Thunderstorm Winds	0/0	\$255,040	Thunderstorm winds produced widespread damage to a mobile home community southwest of DeSteen. Many of the homes had damage to attached sun rooms, awnings and sheds. About 15 trees were blown down. The event was accompanied by a large amount of small hail.
Port Orange	6/16/2005	Thunderstorm Winds	0/0	\$45,020	Thunderstorm winds overturned a mobile home and damaged two others east of Port Orange.
Daytona Beach	6/12/2005	Thunderstorm Winds	0/0	\$11,255	Thunderstorm winds blew down a large tree which damaged a truck.
Deltona	5/22/2006	Thunderstorm	0/0	\$22,212	Thunderstorm winds downed power lines and power transformers in Deltona. downed

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2000 dollars)	DESCRIPTION
		Winds			trees
Daytona Beach Airport	11/15/2004	Thunderstorm Winds	0	\$21,210	Thunderstorm winds peeled back part of a roof on an apartment complex on the barrier island. A band of thunderstorms moved from central Florida to the coast and Lake Okechobee producing hail, strong winds and funnel clouds.
DeLand	4/20/2004	Thunderstorm Winds	0	\$1,000	Thunderstorm winds blew down large tree branches that took out power lines in DeLand. Afternoon pulse thunderstorms produced wind damage in DeLand.
Edgewater	4/20/2004	Thunderstorm Winds	0	\$2,240	Thunderstorm winds blew down trees and power lines in Edgewater. A pre-frontal squall line produced widespread wind damage and hail across central Florida.
New Smyrna Beach	4/20/2004	Thunderstorm Winds	0	\$12,660	Thunderstorm winds blew down trees and power lines in New Smyrna Beach. A pre-frontal squall line produced widespread wind damage and hail across central Florida.
Ormond Beach	6/1/2004	Thunderstorm Winds	0	\$2,060	Ormond Beach dispatch reported trees down on power lines at Nova Road. The daily east coast sea breeze pushed inland and produced thunderstorms over coastal sections of Central Florida.
Fatio	6/21/2004	Thunderstorm Winds	0	\$5,150	Law enforcement reported three trees down across County Road 42. The daily east coast sea breeze pushed inland and produced thunderstorms over coastal and interior sections of Central Florida.
Deerford	6/21/2004	Thunderstorm Winds	0	\$1,000	Law enforcement reported a large tree down across State Road 44. The daily east coast sea breeze pushed inland and produced thunderstorms over coastal and interior sections of Central Florida.
DeFary	10/22/2004	Thunderstorm Winds	0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
Holly Hill	10/22/2004	Thunderstorm Winds	0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
DeSteen	10/22/2004	Thunderstorm Winds	0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
Daytona Beach	10/22/2004	Thunderstorm Winds	0	\$0	A north moving warm front produced widespread thunderstorms across central Florida.
Orange City	4/14/2004	Thunderstorm Winds	0	\$0	A squall line well ahead of a cold front produced numerous thunderstorms with damaging straight-line winds, large hail and a brief, weak tornado. Several Line Echo Wave Pattern (LEWP) features were apparent on radar with rotating comma

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2007 dollars)	DESCRIPTION
					head signatures.
Harbor Point	6/21/2007	Thunderstorm Winds	0/0	20	Numerous strong storms impacted central Florida ahead of a stalled frontal boundary far to the north. Local sea breeze interactions combined with a large-scale outflow boundary propagating to the region prompted the storm development. Many storms produced small hail and wind gusts 45-55 mph, with two storms strengthening to severe levels and resulting in damaging wind gusts.
DeLand	6/21/2007	Thunderstorm Winds	0/0	20	Numerous strong storms developed over east central Florida, with a few strengthening to severe levels and producing wind damage and large hail.
DeLand	7/22/2007	Thunderstorm Winds	0/0	20	A northward-lifting warm front combined with active sea breeze boundaries within an unstable atmosphere produced several severe thunderstorms with nickel to quarter sized hail and localized severe winds.
Lake Harney	7/22/2007	Thunderstorm Winds	0/0	20	Thunderstorms along the east coast sea breeze boundary progressed inland and intensified to produce minor wind damage and a funnel cloud.
DeLand	1/21/2010	Thunderstorm Winds	0/0	20	Numerous strong thunderstorms moved across the county, well ahead of a cold front during the late afternoon and evening. One of the storms became severe and produced localized wind damage. A funnel cloud was also observed by the Daytona Beach Airport (DAB) weather observer.
Ormond Beach	6/22/2010	Thunderstorm Winds	0/0	20	Numerous strong thunderstorms lifted northeast across east-central Florida from mid-afternoon through early evening. Two of the storms became severe and produced damaging winds which downed several trees and large limbs within Orange and Volusia Counties.
DeLand	7/22/2010	Thunderstorm Winds	0/0	20	Saturated grounds from previous rains, along with recent heavy rain and 20 mph wind gusts from a thunderstorm passing 20 minutes earlier, caused a large pine tree to topple as a vehicle was traveling beneath, resulting in a fatality.
Ormond Beach	4/25/2011	Thunderstorm Winds	0/0	20	A pre-frontal squall line crossed central Florida during the morning and early afternoon. A few of the storms became strong to severe and produced high winds and a funnel cloud, primarily across Volusia and Alameda Counties.
Volusia County	6/21/2011	Thunderstorm Winds	0/0	20	Numerous strong to severe storms formed along the east coast sea breeze across the central Florida interior and Volusia County,

SECTION 5: HAZARD PROFILES

TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2007 dollars)	DESCRIPTION
					producing dime to quarter sized hail and winds of 50 to 60 mph.
Volusia County	7/20/2011	Thunderstorm Winds	0	0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
DeLand	7/20/2011	Thunderstorm Winds	0	0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
DeLand	7/20/2011	Thunderstorm Winds	0	0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
Deltona	7/20/2011	Thunderstorm Winds	0	0	A rare Florida derecho affected the region during the late afternoon and early evening, well ahead of a strong cold front. The rapidly moving squall line, contained multiple bow echoes as it moved across the central portion of Florida at 60 mph.
DeLand	7/21/2011	Thunderstorm Winds	0	\$5,000	An isolated severe thunderstorm developed along a boundary collision in central Volusia County and produced wind damage.
Glencoe	5/17/2012	Thunderstorm Winds	0	0	The east coast sea breeze formed in the early afternoon and propagated inland, eventually colliding with the west coast sea breeze over the central peninsula. Storms moved to the east and northeast and produced large hail over DeLand and Volusia Counties.
Oak Hill	7/27/2012	Thunderstorm Winds	0	0	A line of storms developed along the west coast sea breeze and intensified as it interacted with the east coast sea breeze. One of the storms in this line became severe near Haulover Canal.
Volusia County	6/20/2012	Thunderstorm Winds	0	0	Deep southwesterly flow led to the development of several strong to severe thunderstorms, which moved from the Orlando area to the coast of Volusia and DeLand Counties. Peak winds gusts reached 66 mph in Orlando. Thunderstorm winds also peeled back part of a roof from a home in Port Orange.
Volusia County	7/11/2012	Thunderstorm Winds	0	\$10,000	An isolated heavy shower moved onshore from the Atlantic late at night and produced wind damage to the upper story of an apartment complex.

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2007 Dollars)	DESCRIPTION
Deltona	12/15/2012	Thunderstorm Winds	0	\$1,000	A broken line of showers and thunderstorms moved rapidly southeast across Volusia County. Two cells along the line caused minor wind damage to trees, but no structural damage. Part of a tree fell onto powerlines and a vehicle in Deltona, and tree limbs temporarily blocked a road in Steen.
Coronado Beach	02/12/2014	Thunderstorm Winds	0	\$0	A squall line developed out ahead of a cold front over the eastern Gulf of Mexico. Thunderstorms within the squall line produced damaging winds and large hail (although hail was not reported in Volusia County)
Daytona Beach	04/01/2014	Thunderstorm Winds	0	\$0	A broken line of showers moved northeast across Volusia and Brevard Counties. A severe thunderstorm developed near the northern edge of the line and caused localized wind damage near Daytona Beach International Airport and Embry-Riddle Aeronautical University Campus.
Cassadaga Lake Helen	6/10/2014	Thunderstorm Winds	0	\$5,000	Thunderstorms developed over the interior and produced locally damaging winds along with quarter sized hail.
Daytona Airport	6/24/2014	Thunderstorm Winds	0	\$0	A thunderstorm developed rapidly along the east coast sea breeze over coastal Volusia County and produced severe wind gusts and hail up to nickel size at Daytona Beach Airport.
DeLeon Springs	7/14/2014	Thunderstorm Winds	0	\$0	Strong thunderstorms moved into western Volusia County and interacted with the east coast sea breeze.
Coronado Beach	7/25/2014	Thunderstorm Winds	0	\$245,000	An EF-1 tornado touched down within a rural airpark and affected adjacent neighborhoods. Several buildings and small planes were damaged at the airpark, and many trees were damaged or uprooted within the adjacent neighborhood as the tornado tracked northeast. The thunderstorm which produced the tornado was also responsible for wind damage to a fence and the roof of an apartment building on the barrier island in New Smyrna Beach.
Orange City	6/1/2015	Thunderstorm Winds	0	\$0	Several strong to severe thunderstorms developed along the east coast sea breeze as it pushed inland to the Interstate 4 corridor during the afternoon and interacted with other outflow boundaries. Large hail, up to golf ball sized was reported across Deary, Sanford, Lake Mary, Altamonte Springs and Lakeland. Strong winds also felled numerous trees and large tree branches leading to damage to homes and cars in Deary, Astatula, and Lake Mary.

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2007 dollars)	DESCRIPTION
Lake Helen	7/24/2016	Thunderstorm Winds	0/0	\$2,000	An upper level weather disturbance, together with a very unstable airmass and mesoscale boundaries resulted in numerous strong thunderstorms across the central Florida peninsula. Two of the storms produced large hail, from quarter to golf ball size.
Edgewater	7/17/2016	Thunderstorm Winds	0/0	\$5,000	A tropical disturbance, with a well-defined surface circulation, moved onshore near Vero Beach during the early morning hours, then lifted northward along the coast to Volusia County (and beyond) through the evening. By late evening, the system was upgraded to Tropical Storm Julia, as it approached Jacksonville. A rain band associated with the system spawned an EF-0 tornado in southern Brevard County during the early afternoon, resulting in damage to a few residences. Other passing rain bands, produced strong wind gusts along the coast of Brevard and Volusia Counties, one of which resulted in damage to a home in Edgewater. A funnel cloud was also sighted in Lake County.
Hucomer	7/22/2016	Thunderstorm Winds	0/0	\$0	A thunderstorm became severe over southeast Volusia County and produced damage to several trees and powerlines in the town of Edgewater.
New Smyrna Beach Fatio	1/22/2017	Thunderstorm Winds	0/0	\$0	An unusually strong jet stream aided development of an intense squall line which moved rapidly across east central Florida during the evening of January 22. Several thunderstorms developed ahead of the main squall line and became severe, as well as other storms within the squall line itself. Reports of quarter sized hail, wind gusts over 60 mph and funnel clouds were received. A localized area of tree damage also occurred.
Weland Airport Holly Hill	11/27/2017	Thunderstorm Winds	0/0	\$50,000	A strong thunderstorm embedded within a rain area ahead of a cold front intensified as it traveled quickly northeast across Volusia County. Mobile homes were damaged well inland in Weland, then over 20 minutes later, the storm damaged mobile homes in Daytona Beach. Rain totals reached five to seven inches in a short period of time from Hammond-by-the-Sea to Holly Hill. High levels of standing water and some impassible roadways occurred.
Weland Airport Allandale	4/15/2017	Thunderstorm Winds	0/0	\$0	The Storm Prediction Center had designated a slight change of severe weather for all of east central Florida. A high amplitude shortwave over the Mississippi River Valley quickly moved south across the Florida

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TABLE 5.9: Historical Thunderstorm Occurrences Resulting in Property Damage

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2007 dollars)	DESCRIPTION
					peninsula during the afternoon and evening hours. A cold front associated with the intensifying trough was also observed crossing the Florida peninsula. Ahead of the cold front moderate thermodynamic instability with 100mb temperatures between -2 to -5 degrees Celsius, and 500mb between -2 to -10 degrees Celsius, resulting in lapse rates of 6-6.5 C/km. 10 knot winds atop a hot streak over the north central Gulf of Mexico created resulting flow from the southwest. Numerous showers and thunderstorms developed along the cold front, eventually forming a line that crossed across all of east central Florida.
Ormond Beach	2/22/2017	Thunderstorm Winds	1/1	20	One person was killed, and another injured in Ormond Beach when winds from a non-severe thunderstorm knocked over a large, mostly dead tree onto them.
Deltona	5/4/2017	Thunderstorm Winds	0/0	20	An area of high pressure located over the central Atlantic was the dominant feature affecting weather over central Florida. This led to west to southwest winds at the surface that pushed deep moisture from the Gulf across the area. Hot daytime temperatures, and cold temperatures in the middle atmosphere provided the necessary ingredients for strong to severe thunderstorms to develop.
DeLand	6/22/2017	Thunderstorm Winds	0/0	20	Rich moist air was moving across the Florida peninsula as the area was sandwiched between the Atlantic high pressure to the south and a low-pressure system over the eastern half of the U.S. This combination of weather systems provided substantial energy in the atmosphere, that when combined with daytime heating and southwest winds at the surface led to the development of numerous strong thunderstorms across east central Florida. As these storms pushed across the peninsula they produced and interacted with many outflow boundaries and the east coast sea breeze. Several storms became severe as they moved over Seminole and Volusia Counties, where wind damage was reported. Also, a motorcyclist was killed when he was struck by lightning while on Interstate 95 in Volusia County.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS AVAILABLE
 FROM THE NATIONAL CLIMATIC DATA CENTER

SECTION 5: HAZARD PROFILES**5.6.4 Probability of Future Occurrences**

Thunderstorms are frequent in Volusia County. During the summer, Volusia County experiences a thunderstorm nearly every afternoon. They will undoubtedly continue to occur, thereby threatening the lives, safety, and property in Volusia County. Therefore, the probability of future occurrences is high.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from thunderstorms and that future mitigation and adaptation strategies related to this hazard should be considered.

SECTION 5: HAZARD PROFILES

5.2 TORNADO

5.2.2 Background

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 200 miles per hour and are a few yards wide. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction, carving a path over a mile wide and several miles long and turning normally harmless objects into deadly missiles.

Over 200 tornadoes are reported nationwide annually, resulting in an average of 20 deaths and 1,500 injuries (FEMA, 2002). They are more likely to occur during the months of March through May and can occur at any time of day, but are likely to form in the late afternoon and early evening. Further, the tornadoes associated with tropical cyclones are most frequent in September and October when the incidence of tropical storm systems is greatest. The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). The magnitude of tornadic activity is reported using the Enhanced Fujita Scale (Table 5.22). However, tornado magnitudes prior to 2005 were classified using the traditional version of the Fujita Scale (Table 5.22).

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from tornadoes and that future mitigation and adaptation strategies related to this hazard should be considered.

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TABLE 5.10: Enhanced Fujita Scale for Tornadoes (Effective 2005 and after)

F-SCALE NUMBER	INTENSITY	WIND SPEED (MPH)	TYPE OF DAMAGE DONE
F0	GALE	65-75	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE	76-110	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT	111-135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE	136-165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING	166-200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Weather Service

SECTION 5: HAZARD PROFILES

TABLE 5.11: The Fujita Scale (Effective Prior to 2005)

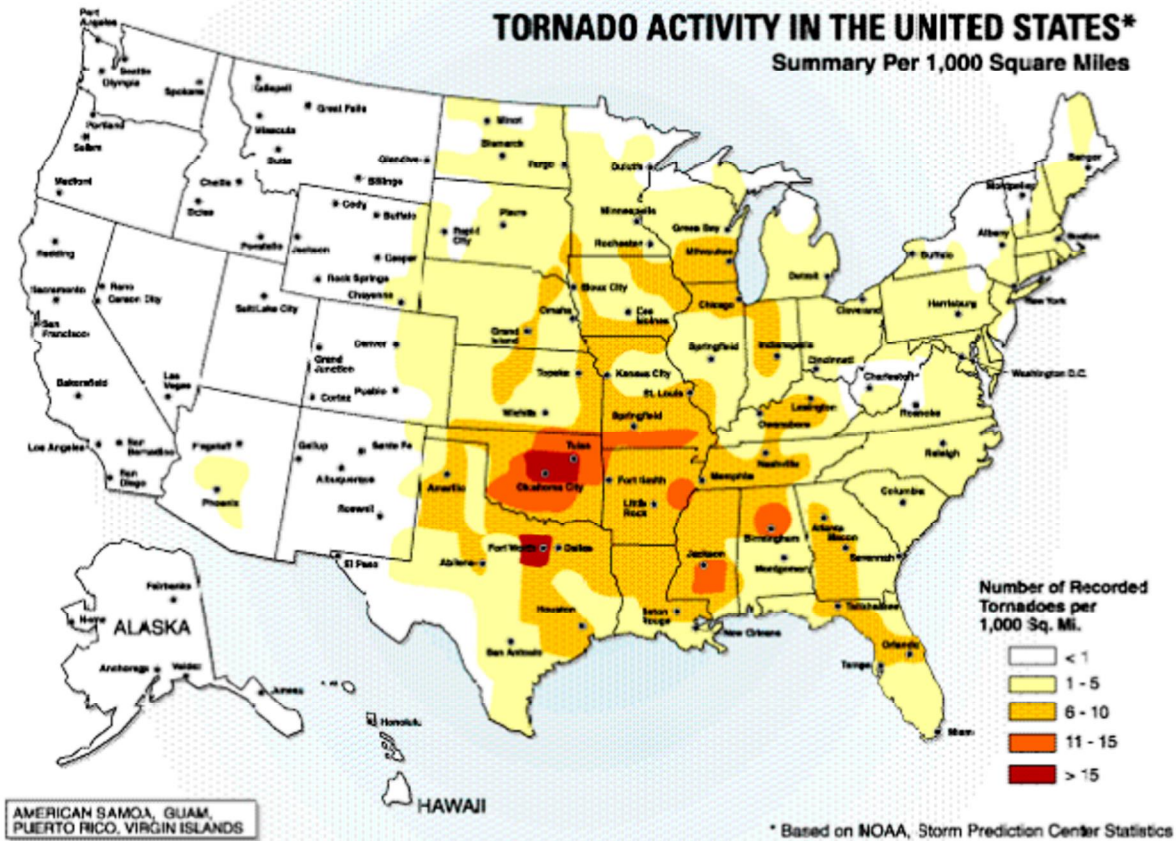
F-SCALE NUMBER	INTENSITY	WIND SPEED (MPH)	TYPE OF DAMAGE DONE
F0	GALE	40-45	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE	46-50	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT	51-55	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE	56-60	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING	61-69	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE	70-74	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	UNPRECEDENTABLE	75-83	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: National Weather Service

According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas and Florida. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of "tornado alley"), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Figure 5.6** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

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FIGURE 5.6: Tornado Activity in the United States



Source: Federal Emergency Management Agency

5.7.2 Location and Spatial Extent

Based on historic data, tornadoes occur throughout the state of Florida at a rate of 1-10 confirmed touchdowns per 1,000 square miles. Florida tornadoes typically impact a relatively small area; however, events are completely random and it is not possible to predict specific areas that are more susceptible to a tornado strike over time. Therefore, it is assumed that all of Volusia County is uniformly exposed to this hazard. April, May, and June are considered the peak months for Florida tornadoes. A review of historical data shows that tornadoes within Volusia County are typically in the F0, F1 and, more rarely, the F2 range. F3 and F4 tornadoes are very rare, with three occurring since 1950. The county has never experienced a F5 tornado on record.

5.7.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of 22 recorded tornado events in Volusia County since 1952. Each of these events occurred in the Volusia County study area as listed in Table 5.12. Two deaths, 151 injuries, and nearly \$205 million in property resulted from these events.

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The magnitude of these tornadoes ranged from F0 to F2 in intensity, with approximate locations for each shown in **Figure 5.7**.

TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
Volusia County	5/22/1950	F1	0	\$28,251	Not Available
Volusia County	7/12/1952	unknown	0	\$0	Not Available
Volusia County	10/12/1952	unknown	0	\$0	Not Available
Volusia County	7/14/1960	unknown	0	\$0	Not Available
Volusia County	7/17/1960	unknown	0	\$0	Not Available
Volusia County	7/27/1961	F2	0	\$177,115	Not Available
Volusia County	7/27/1962	F1	0	\$21,225	Not Available
Volusia County	7/27/1962	unknown	0	\$0	Not Available
Volusia County	1/12/1964	F0	0	\$21,222	Not Available
Volusia County	7/27/1964	unknown	0	\$0	Not Available
Volusia County	7/20/1967	F2	0	\$160,222	Not Available
Volusia County	7/22/1967	unknown	0	\$12,222	Not Available
Volusia County	10/22/1967	unknown	0	\$0	Not Available
Volusia County	7/17/1970	F0	0	\$0	Not Available
Volusia County	7/27/1971	F2	0	\$16,624	Not Available
Volusia County	5/20/1972	F2	0	\$124,262	Not Available
Volusia County	6/17/1972	F1	0	\$124,262	Not Available
Volusia County	7/22/1972	F2	0	\$124,262	Not Available
Volusia County	4/11/1975	F0	0	\$12,504	Not Available
Volusia County	4/14/1975	F0	0	\$0	Not Available
Volusia County	5/15/1975	F0	0	\$104,204	Not Available
Volusia County	7/27/1975	F0	0	\$12,504	Not Available
Volusia County	5/22/1976	F0	0	\$222,244	Not Available
Volusia County	5/27/1976	F0	0	\$0	Not Available
Volusia County	7/27/1976	F0	0	\$11,242	Not Available
Volusia County	4/17/1977	F1	0	\$261,242	Not Available
Volusia County	6/27/1977	F0	0	\$10,225	Not Available

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TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
Volusia County	??2??1.???	F0	0??	??0	Not Available
Volusia County	??1.??1.???	F1	0??	??6,125	Not Available
Volusia County	??4??1.???	F0	0??	??10,??5	Not Available
Volusia County	??22??1.???	F0	0??	??0	Not Available
Volusia County	??2??1.???	F0	0??	??0	Not Available
Volusia County	1??4??1.???	unknown	0??	???,???	Not Available
Volusia County	5??5??1.???	F1	0??	???,???	Not Available
Volusia County	5????1.???	F1	0??	??,???,???	Not Available
Volusia County	????1.???	F2	0??	??1,624,62?	Not Available
Volusia County	??2??1.???	F0	0??	??0	Not Available
Volusia County	????1.???	F1	0??	??25,000	Not Available
Volusia County	6??1.??1.???	F1	0??	??25?,000	Not Available
Volusia County	4??15??1.???	F1	0??	??6,??5	Not Available
Volusia County	4??2??1.???	F1	0??	??56,??5	Not Available
Volusia County	11??20??1.???	F2	0??	??5,6??,514	Not Available
Volusia County	4??14??1.???	F0	0??	??5?,??1	Not Available
Volusia County	6??2??1.???	F1	0??	??5,???,06?	Not Available
Volusia County	2????1.???	F0	0??	??51,206	Not Available
Volusia County	??14??1.???	F1	0??	??51,206	Not Available
Volusia County	1??21??1.???	F1	0??	??4??4,0??	Not Available
Volusia County	5??11??1.???	F0	0??	??0	Not Available
Volusia County	11????1.???	F0	0??	??5155	Not Available
Edgewater	10????1.???	F2	0??	??,4??1,216	In Edgewater, a 400-yard-wide F2 tornado touched down near I-??5. The smaller F0 tornadoes in Pierson, Deltona, and Daytona Beach Shores caused minor in the affected areas, including blowing out 12 windows in Daytona Beach Shores.
Pierson	10????1.???	F0	0??	??0	
Deltona	10????1.???	F0	0??	??0	
Daytona Beach Shores	10????1.???	F0	0??	??,14?	
New Smyrna Beach	4??2??1.???	F0	0??	??0	The F0 tornado downed trees and damaged dozens of homes, including 20 in New Smyrna Beach
Pierson	4??2??1.???	F0	0??	???,??56	

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TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
Port Orange	4/22/21/2222	F0	0/0	\$162,212	alone.
New Smyrna Beach	4/22/21/2222	F0	0/0	\$242,402	
Oak Hill	2/5/21/2222	F0	0/0	\$41,222	The brief touchdown damaged 2 houses and 2 mobile homes.
New Smyrna Beach	11/22/21/2222	F2	0/22	\$12,566,425	A rapidly intensifying tornado initially touched down in New Smyrna Beach about 1 mile west of U.S. Highway 1 between Enterprise and Wayne Avenues. The tornado moved east northeast at about 50 mph damaging several homes and downing trees and power lines. It lifted just west of Highway 1 after passing Chisholm Elementary School. The tornado then struck New Smyrna Beach High School producing Fujita Scale F1 damage. As the tornado intensified to a strong F2 category, it passed through the Venetian Villas subdivision and the Diamond Head Condominiums. A number of large well-built homes were destroyed. Many of the units in the 10 story Diamond Head Condominiums received major damage as high winds blew out exterior glass walls and blew furniture into the adjoining Indian River Lagoon. The tornado then crossed the Intracoastal Waterway and passed over the barrier island between Robinson Road and East Street where a number of large well-built homes were almost completely destroyed. The tornado then moved over the Atlantic Ocean. In all 22 people were injured, six requiring hospitalization. Thirty-one homes were destroyed and 220 were damaged. Damage estimates were near 14 million dollars.
Emporia	2/16/21/2222	F0	0/0	\$111,202	Sixteen mobile homes were damaged and one was destroyed.
Daytona Beach	2/22/21/2222	F2	1/2	\$5,504,621	This tornado cell caused extensive

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TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/INJURIES	PROPERTY DAMAGE (\$ DOLLARS)	DESCRIPTION
DeFrees	2/22/2001	F2	1/0	\$1,226,120	damage and two deaths throughout Volusia County. In Daytona beach one person was killed and three others were injured while in a mobile home. In DeFrees, a man staying in a recreational vehicle was killed.
Oak Hill	2/22/2001	F2	0/0	\$622,025	
Port Orange	2/22/2001	F0	0/0	\$122,612	Thirty-three mobile homes were damaged with this F0 tornado.
New Smyrna Beach	2/21/2000	F0	0/0	\$12,042	This tornado caused minor damage including power outages and downed signs and trees.
Daytona Beach	2/21/2001	F1	0/5	\$6,222,250	This F1 damaged over 100 houses and dozens of vehicles, many due to fallen trees. Five people were injured.
New Smyrna Beach	2/14/2001	F0	0/0	\$20,222	This tornado was a result of a rainstorm associated with Tropical Storm Gabriel. Twelve mobile homes were damaged and three were destroyed.
Daytona Beach	2/22/2004	F0	0/0	\$0	A waterspout came ashore, blowing branches from trees.
South Daytona	2/21/2004	F1	0/0	\$0	This tornado cell was associated with Hurricane Charley. It caused minor damage to homes, commercial buildings, and trees.
Daytona Beach Shores	2/21/2004	F0	0/1	\$0	
DeLand	12/25/2006	F2	0/5	\$2,221,212	An F2 tornado touched down just west of North Stone Street in DeLand and moved northeast crossing Highway 12. It moved across the Fernwood mobile home community and continued northeast over Meadowlea Estates mobile home community. It lifted just north of Carter Road. Fifty-two residences were destroyed and 162 were damaged. Five people were seriously injured.
Daytona Beach (Airport)	12/25/2006	F2	0/6	\$54,626,250	The same system that caused five injuries and damaged 162 homes in DeLand touched down at Daytona Beach International, destroying 40 Embry Riddle University aircraft and the two-story administration building. East of Embry Riddle Aeronautical

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TABLE 5.12: Historical Tornado Impacts

LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
					University, 42 apartments units were destroyed and 200 were damaged.
Deerford	2/2/2007	F2	0/42	\$55,166,000	The tornado that killed 12 people in Lake County moved east across the St. Johns River, crossed into Volusia county at Lake Deerford and moved across the land as an F2 tornado. It was still moving east northeast at 50 MPH as it damaged 222 and destroyed 106 residences in the the land area. There were no fatalities in Volusia County but 42 people were injured.
New Smyrna Beach (Airport)	2/2/2007	F1	0/0	\$6,265,400	
Lake George	7/22/2007	F0	0/0	\$1,222	Tornado-force winds caused damage to a restaurant and apartment complex.
Port Orange	7/24/2007	F0	0/1		This tornado was caused by a sea breeze merger, when winds from both coasts meet and cause the rotation. Although it was classified as the mildest of twisters, it caused damage to 162 homes in Port Orange. Of these, seven were totally destroyed, eight had major damage, and twenty-six had moderate damage. The same system produced a waterspout that came ashore in Armond Beach, destroying a catamaran.
Armond Beach	7/24/2007	F0	0/0		
Edgewater	7/27/2010	F0	0/0	\$50,000	A waterspout formed within a thunderstorm over the intracoastal river, then moved onshore the adjacent barrier island in New Smyrna Beach and produced minor damage as it crossed to the Atlantic coast.
Edgewater	7/11/2010	F0	0/0	\$5,000	Scattered thunderstorms trained northward near the Florida east-central coast, within a strong southerly flow due in part to the presence of Tropical Depression Five remnants near the central Gulf coast. Around mid-day, a waterspout developed over the intracoastal river and moved onshore the mainland in Edgewater, producing minor damage. Several hours later, another storm developed rotation and produced a brief touchdown in a wooded area, farther inland over southern Volusia County.

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TABLE 5.12: Historical Tornado Impacts

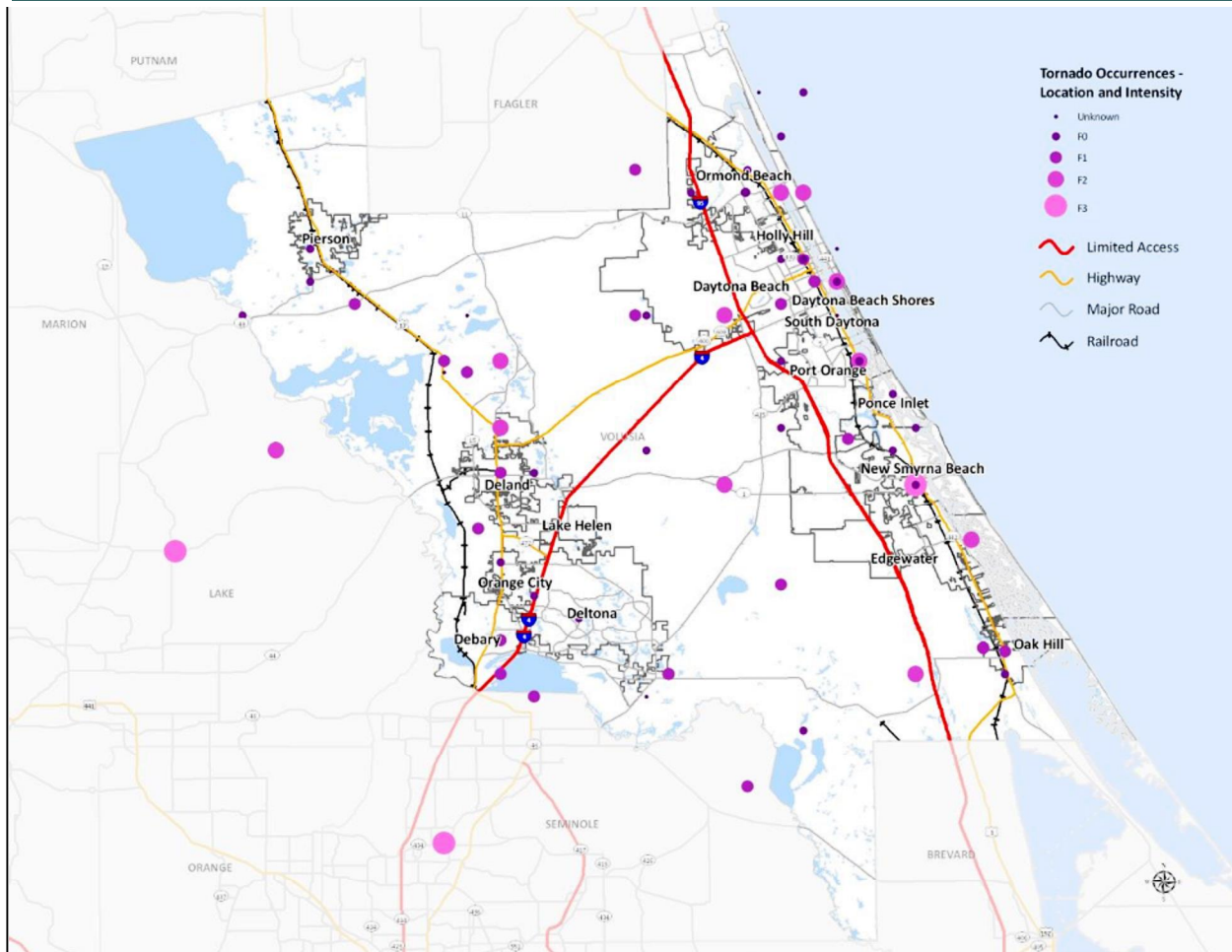
LOCATION	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	DESCRIPTION
Glencoe	07/11/2010	F0	0/0	0	Scattered thunderstorms trained northward near the Florida east-central coast, within a strong southerly flow due in part to the presence of Tropical Depression Five remnants near the central Gulf coast. Around mid-day, a waterspout developed over the intracoastal river and moved onshore the mainland in Edgewater, producing minor damage. Several hours later, another storm developed rotation and produced a brief touchdown in a wooded area, farther inland over southern Volusia County.
Volusia County	12/10/2012	F0	0/0	\$1,000	Very moist southwest winds developed across east-central Florida well in advance of a cold front and associated upper level disturbance. Strong daytime heating, combined with moderate low-level wind shear, resulted in numerous strong storms, two of which produced tornadoes. The first tornado began as a waterspout over Lake Apopka, then crossed the northeast shore of the lake and remained on the ground for a short distance. Although the waterspout tornado affected a rural area, several citizens witnessed the event. The second tornado impacted a mobile home park and adjacent wooded area in Edgewater, then became a waterspout as it crossed the intracoastal river, before moving across the barrier island as a tornado. Significant damage occurred at the mobile home park, with only minor damage on the barrier island. Several funnel clouds were also observed.
Volusia County	12/10/2012	F1	0/2	\$1.2 Million	Although the waterspout tornado affected a rural area, several citizens witnessed the event. The second tornado impacted a mobile home park and adjacent wooded area in Edgewater, then became a waterspout as it crossed the intracoastal river, before moving across the barrier island as a tornado. Significant damage occurred at the mobile home park, with only minor damage on the barrier island. Several funnel clouds were also observed.
Edgewater	07/25/2014	F0	0/0	0	A tornado struck down in Edgewater at Park Avenue and Wildwood Drive near Massey Air Park at 4:00pm, causing damage to several hangars and planes. Winds reached 65 to 75 mph.
Ormond Beach	09/10/2017	F1	0/0	0	Associated with Hurricane Irma.
Ariel	06/01/2017	F0	0/0	\$10,000	After storms developed over Orlando, they pushed east towards the southeastern Volusia County coastline. One storm managed to produce a very weak, short-lived tornado (land spout) in Oak Hill.

Source: National Climatic Data Center

NOTES: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS AVAILABLE TO THE NATIONAL CLIMATIC DATA CENTER

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FIGURE 5.2: Locations of Historical Tornado Events in Volusia County



Source: National Oceanic and Atmospheric Administration

5.2.2 Probability of Future Occurrences

The probability of a future tornado affecting Volusia County is high. According to historical records, Volusia County experiences, on average, more than one (1.2) confirmed tornado events annually. While the majority of these events are small in terms of size, intensity and duration, a greater number of stronger storms (i.e., F2 and F3 tornadoes) have been reported in the past decade. Further, even a minor tornado can cause substantial damage. In conclusion, tornadoes pose a significant threat to lives and property in Volusia County.

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HYDROLOGIC HAZARDS

5.8 COASTAL EROSION

5.8.1 Background

Coastal erosion is a hydrologic hazard defined as the wearing away of land and loss of beach, shoreline, or dune material and is measured as the rate of change in the position or horizontal (landward) displacement of a shoreline over a period of time. Short-term erosion typically results from episodic natural events such as hurricanes and storm surge, windstorms and flooding hazards, but may be exacerbated by human activities such as boat wakes, removal of dune and vegetative buffers, shoreline hardening and dredging. Long-term erosion is a function of multi-year impacts such as wave action, sea level rise, sediment loss, subsidence and climate change. Climatic trends can change a beach from naturally accreting to eroding due to increased episodic erosion events caused by waves from an above-average number of storms and high tides, or the long-term effects of fluctuations in sea level.

Natural recovery from erosion can take years, often decades. If a beach or dune system does not recover quickly enough naturally, coastal and upland property may be exposed to further damage in subsequent coastal erosion and flooding events. Human actions to supplement natural coastal recovery, such as beach nourishment, dune stabilization and shoreline protection structures (e.g., sea walls, groins, jetties, etc.) can mitigate the hazard of coastal erosion, but may also exacerbate it under some circumstances.

Death and injury are not associated with coastal erosion; however, it can cause the destruction of buildings and infrastructure and represents a major threat to the local economies of coastal communities that rely on the financial benefits of recreational beaches.

5.8.2 Location and Spatial Extent

All coastal areas in Volusia County are susceptible to coastal erosion. Using Florida Department of Environment field data beginning in 1992, it is clear that Volusia County shorelines are moving due to erosion, accretion, and beach nourishment projects². Further, nearly half of the 42 miles of shoreline in Volusia County are classified as critically eroded.

The beach ridge in Volusia County ranges from 200 to 2,000 feet in width. A majority of the county, ranging approximately from Ormond Beach to Methune Beach, has fine-grained quartz sand. Sand in areas north and south of this area consist of a shell-quartz mixture and have steeper slopes than the central county. The southernmost mile of shoreline in Volusia County makes up part of the Canaveral National Seashore Park, while the northernmost area is part of the North Peninsula State Recreation Area.

² Emmet and Jenny Cheng. Shoreline Beach Change Estimates, Volusia County, 2000. Office of Beaches and Coastal Systems, Florida Department of Environmental Protection; Beaches and Shores Research Center, Florida State University.

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5.8.3 Historical Occurrences

According to the National Climatic Data Center, there have been five events with reported coastal erosion impacts in Volusia County since 1999, as shown in **Table 5.13**. Because the erosion events were part of other hazard events (e.g., storm surge and hurricanes), the monetary damage for the erosion alone is unknown.

TABLE 5.13: Historical Coastal Erosion Impacts

LOCATION	DATE	DEATHS/ INJURIES	PROPERTY DAMAGE (2000 dollars)	DESCRIPTION
Volusia County	09/14/2004	0	\$56,444,400	Hurricane Floyd caused significant beach erosion in Volusia County. If the property damage estimates, over \$10 million was attributed to beach erosion.
St. Lucie and Volusia Counties	10/14/2004	0	\$62,500,000	Hurricane Irene caused beach loss of four to ten feet in the affected areas with damage in the millions.
DeLand and Volusia Counties	04/2001	0	\$6,000,000	Storm tide from a tropical storm reached two feet above normal, causing significant beach erosion.
St. Lucie and Volusia Counties	05/2004	0	\$440,400,221	Severe beach erosion was reported from Hurricane Jeanne, a category 4 storm.
Volusia County	02/2000	0	Unknown	New Smyrna Beach experienced a loss of 50 feet of new sand due to wind gust of over 45 MPH from Tropical Storm Fay. Even Orange and Seminole counties experienced riverine erosion along the St. Johns River.

Source: National Climatic Data Center (Most Recent Data Compiled on online Database; October 2010)

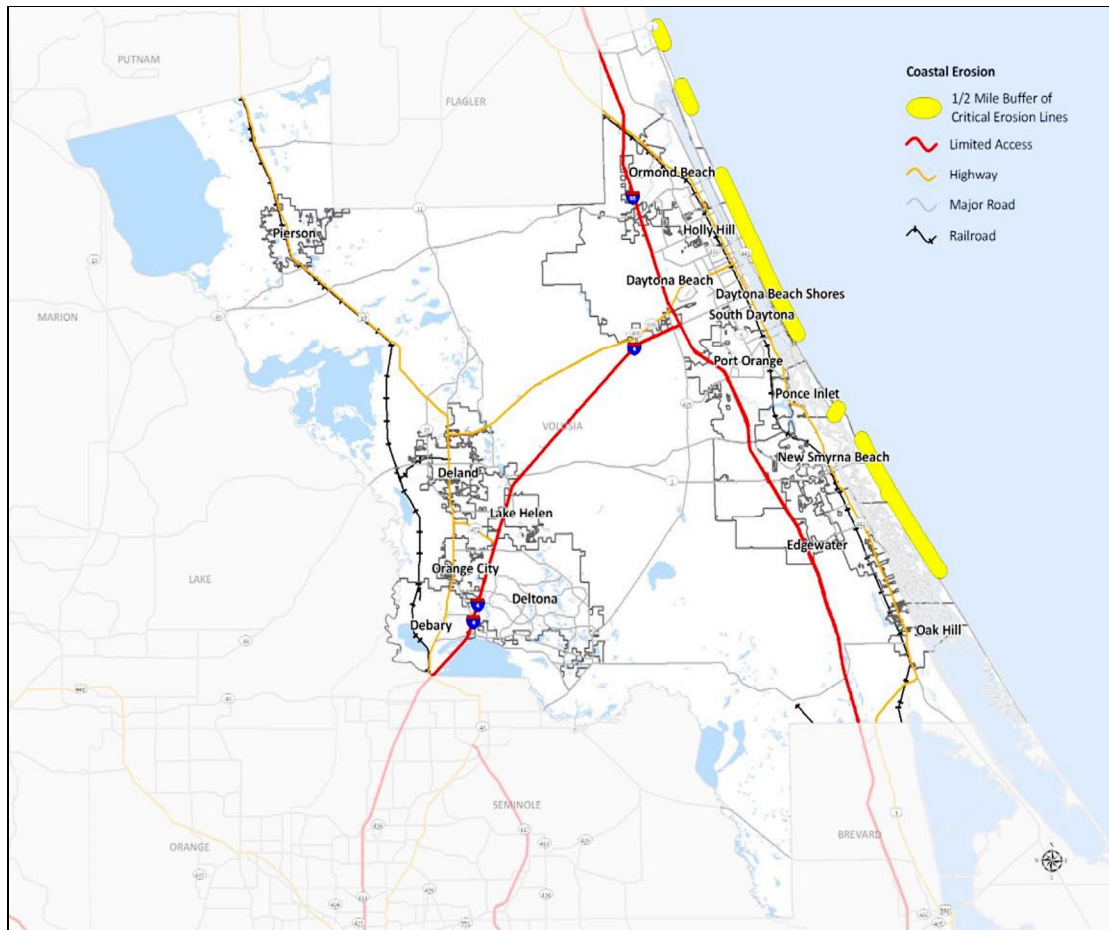
The severity of coastal erosion is typically measured through a quantitative assessment of annual shoreline change for a given beach cross-section of profile (feet or meters per year) over a long period of time. Erosion rates vary as a function of shoreline type and are influenced primarily by episodic events, but can be used in land use and hazard management to define areas of critical concern.

According to the Florida Bureau of Beaches and Coastal Systems, a division within the Florida Department of Environmental Protection, there are 4 critically eroded beaches in Volusia County, totaling over 22 miles of beachfront. These areas are highlighted in **Figure 5.8**. A critical beach erosion area is defined as an area where natural or human processes has caused or contributed to the erosion or recession of the beach or dune system (Florida Bureau of Beaches and Coastal Systems). The largest contiguous area of critically eroded beach is an 11 mile stretch between Ormond Beach and Daytona Beach Shores. This area is threatening recreation and development opportunities in the area. There are also 2 miles of critically eroded beachfront between New Smyrna Beach and Methune Beach. In addition, there are two segments of critically eroded beach in northern Volusia that threaten State Road A1A.

Office of Beaches and Coastal Systems, Florida Department of Environmental Protection

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FIGURE 5.8: Critical Erosion Areas in Volusia County



Source: Florida Department of Environmental Protection, Division of Beaches and Coastal Systems

5.8.4 Probability of Future Occurrences

The probability of the continuing occurrence of coastal erosion in the coastal areas of Volusia County is high. Florida's Bureau of Beaches and Coastal Systems estimates an average of a one foot loss annually for Volusia County in stable or accretionary areas. The area between Ormond Beach and Daytona Beach Shores are eroding at a rate between zero and 0.5 feet annually, according to a 2000 study. Northern areas of the county, including the North Peninsula State Recreation Area, lose between 0.5 and 1.5 feet annually. Areas south of the Ormond Beach to Daytona Beach Shores stretch have lower expected erosion rates due to extensive armoring (e.g., beach walls and revetments). However, natural erosion is occurring southward from South of Ponce de Leon Inlet. Loss rates are as high as 1.5 feet per year and decrease heading in southerly direction. The damaging impacts of coastal erosion are lessened through continuous (and costly) beach nourishment and structural shoreline protection measures. However, it is likely that the impacts of coastal erosion will increase in severity due to future episodic storm events. The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hail and that future mitigation and adaptation strategies related to this hazard should be considered.

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5.9 DROUGHT

5.9.1 Background

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Droughts are typically classified into one of four types¹:

- ▶ **Meteorological:** The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- ▶ **Hydrologic:** The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- ▶ **Agricultural:** Soil moisture deficiencies relative to water demands of plant life, usually crops.
- ▶ **Socioeconomic:** The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Droughts are slow-onset hazards, but over time can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant.

5.9.2 Location and Spatial Extent

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). Evident in **Figure 5.9**, the Palmer Drought Severity Index Summary Map for the United States, droughts affect most areas of the United States, but are less severe in the Eastern United States.

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. According to the Palmer Drought Severity Index (Figure 5.9), Florida has the relatively low risk for drought hazard. However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map. Further, it is assumed that Volusia County would be uniformly exposed to drought, making the spatial extent potentially widespread. During long periods of drought, a disruption in the water cycle can have potentially damaging effects, including substantial crop loss in the northwestern portion of the county. Periods of drought can exacerbate the ignition of wildfires that can damage the natural and built environment, as has occurred before in Volusia County.

As of October 2012, the Pech Ryan Drought Index (PRDI) for Volusia is in the less than 200 to 201-400 range, a relatively low score on a scale that measures up to from 0 (wet) to 200 (arid conditions). The score rose to as high as 522 in April 2012.

One of the most severe cases of drought in Florida occurred from October 2010 until June of 2012 in which a major portion of the state displayed EE (Drought Extreme) conditions. During this extensive

¹ Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

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period, the two-month period of April and May of 2012, showed the highest level of drought concern with portions of the state under a D-4 Drought Exceptional condition (The National Drought Mitigation Center, 2014). Thus, Volusia County can experience the full array of drought conditions, from D0 to D4. D0 AA describes D4 events as having Dextensive and widespread crop and pasture losses, fire risk, shortages of water in reservoirs, stream and wells that yield water emergencies. D4 can loosely be likened to a Donce-in-a-generation type of drought noted by the second percentile, or a 1 in 50-year drought.

Drought Monitor Intensities

Scale	Severity
D0	Abnormally Dry
D1	Drought- Moderate
D2	Drought- Severe
D3	Drought- Extreme
D4	Drought- Exceptional

Source: D0 AA

Drought Duration

U.S. Drought Monitor Classification Scheme

S Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L Long-Term, typically more than 6 months (e.g. hydrology, ecology)

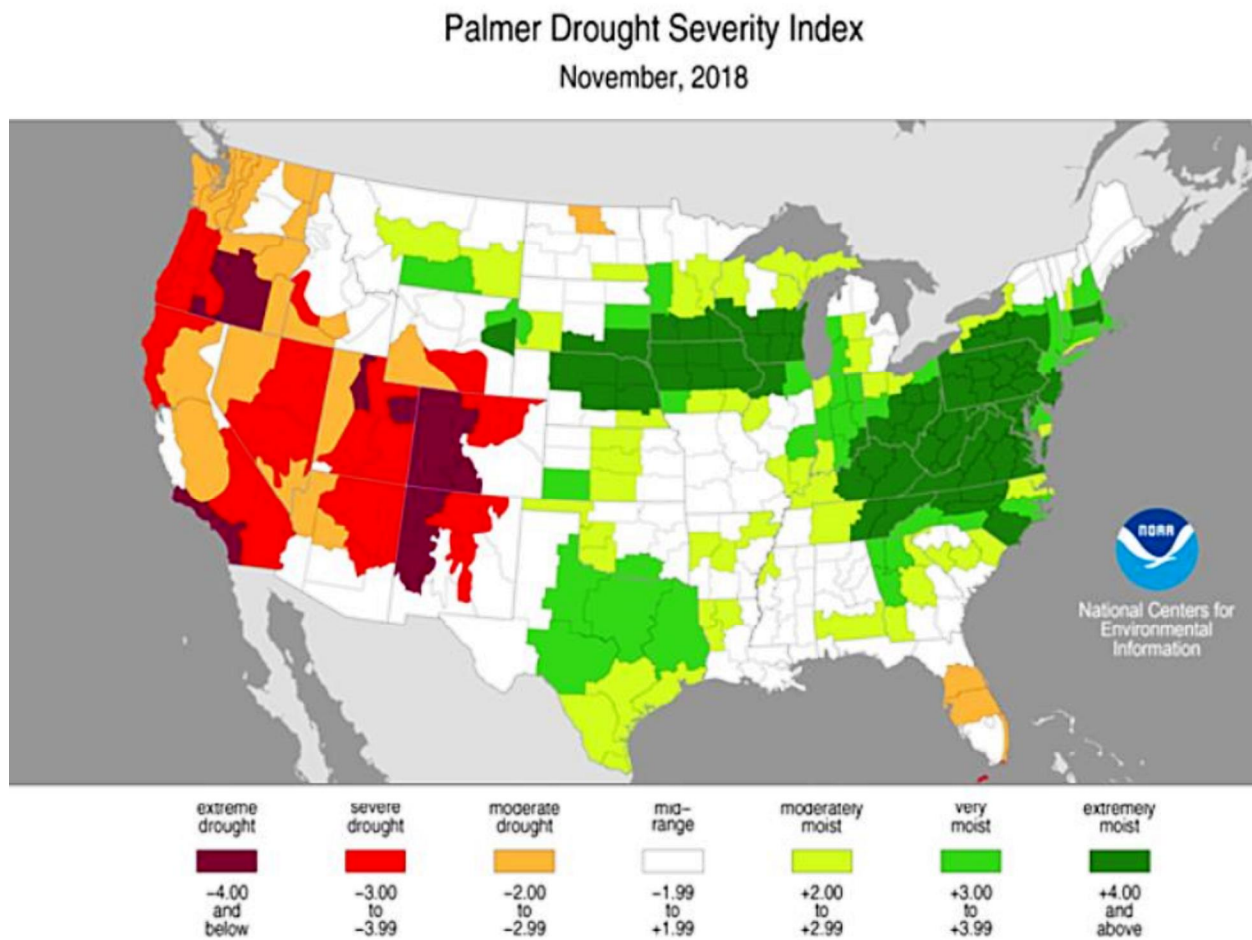
**Both of these have been observed in Florida. In the late 1990's, a long term drought effected Central Florida, while the most recent drought (2010-2012) was also a long term drought.*

Drought Impacts: A drought is noted as a period of unusual dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. There are four basic approaches to measuring drought (Wilhite, 1995):

- Meteorological- defined usually on the basis of the degree of dryness (in comparison to some Dnormal or average amount) and the duration of the dry period.
- Agricultural-drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels.
- Hydrological- associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (i.e., streamflow, reservoir and lake levels, groundwater).
- Socioeconomic-associated with the supply and demand of some economic good with elements of meteorological, hydrological, and agricultural drought.

In partnership with County and municipal staff and the St. Johns River Water Management District, a contingency plan is in place to restrict water use across the county in an effort assist with water conservation efforts during periods of drought. Some direct impacts related to drought include reduced crop production, increased fire hazard, reduced water levels at major lakes and rivers, damage to fish habitat, and income loss for the agriculture industry. These impacts have been recorded as a result of historic events including the extreme drought conditions of 2010-2012.

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Figure 5.9: Palmer Drought Severity Index Summary Map for the United States

Source: NOAA (Note: This map updates frequently. This is only a snapshot in time and not a long-term trend or view)

5.9.3 Historical Occurrences

Secondary research was conducted to determine the historical drought occurrences in Volusia County. It was determined that general drought conditions were present throughout Florida in 1991, 1995, 1999-2000, and 2001. Volusia County is part of the St. Johns River Water Management District, which monitors well levels throughout its jurisdiction. The Keetch-Griffin Drought Index is a numerical scale (0-100) that measures the amount of moisture in the soil. A zero indicates wet, full saturation conditions while an 100 represents extreme drought conditions. It is often used to assess the danger of wildfires but is also an indication of drought. Therefore, it is reported where information is available. The following highlight some of the events from the aforementioned years.

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1981: Drought conditions were reported throughout Southern Florida. Three firefighters narrowly escaped injury while fighting a drought-related wildfire. Officials from St. Johns River Water Management District ordered a mandatory 15 percent reduction in water use for public water supply, industrial, commercial and self-supplied users¹⁰.

1985: A short, six-month drought was reported in Volusia County. In addition to sparking wildfires, it led to a water warning calling for voluntary water usage restrictions¹¹. On June 20, 1985, the water warning was expanded throughout St. Johns Water Management District. Volusia County had been placed under the warning months earlier¹². On August 14, the warning was lifted as counties were able to meet usage demands due to recent rainfall.

1998: Volusia County reported a Drought Index reading of 200. Wildfires were abundant throughout the County. This year was reported as having the driest conditions in 50 years. The drought did not officially end until 2002¹³.

January 1999: Volusia County reported a Drought Index of 500.

May 2000: The May Drought Index was reported at 422 to 500. By early 2001 the Drought Index average for Volusia County was 601.

February 2001: During this drought, drought index 4 covered 22.0% of Florida.

April 2006 – August 2008: This prolonged drought covered much of the state in 2 and 3 conditions.

October 2010 – June 2012: This prolonged drought covered much of the state in 1 and 2 conditions. 2 conditions peaked in June 2012, covering more than 20% of the state.

5.9.4 Probability of Future Occurrences

It is assumed that all of Volusia County is uniformly exposed to a drought event. As with any location, some areas of the county may be affected more severely than others during a drought. Given the frequency of previous events, warm temperatures, and average rainfall, the probability of future drought events is high.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from winter storms/freezes and that future mitigation and adaptation strategies related to this hazard should be considered.

¹⁰ -Banner. Associated Press. July 1, 1981.

¹¹ dependent. Associated Press.

¹² and Warning Ar

¹³ NAVARRO, MIREYA.

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ge 1, New York Times.

SECTION 5: HAZARD PROFILES

5.10 FLOOD

5.10.1 Background

Flooding is the most frequent and costly natural hazard in the United States, a hazard that has caused more than 10,000 deaths since 1900. Nearly 20 percent of presidential disaster declarations result from natural events where flooding was a major component.

Floods generally result from excessive precipitation, and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with storm-induced wave or tidal action; and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is typically determined by a combination of several major factors, including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface.

A *general flood* is usually a long-term event that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves and heavy rainfall produced by hurricanes, tropical storms and other large coastal storms¹⁴. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Most *flash flooding* is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.



Maytown Road experienced extreme flooding during the 2004 Volusia County rain storms

¹⁴ While briefly mentioned here, coastal flooding is more thoroughly addressed under

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The periodic flooding of lands adjacent to rivers, streams and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 100-year floodplain represents a 1 percent annual chance of flood. The frequency of flood events, such as the 1 percent annual chance flood, is determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 1 percent annual chance flood refers to area in the 100-year floodplain and has a 1 percent chance of occurring in any given year. Similarly, the 0.2 percent flood covers the 500-year floodplain and has a 0.2 percent chance of occurring in any given year. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

5.10.2 Location and Spatial Extent

Many areas of Volusia County are susceptible to riverine and urban (stormwater) flooding, and its coastal areas are also very susceptible to tidal and coastal flooding due to coastal storm events including storm surge.¹⁵ **Figure 5.10** illustrates the location and extent of currently mapped Special Flood Hazard Areas for Volusia County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.¹⁶ This includes Zones AE (100-year floodplain), Zone VE (100-year coastal flood zones, associated with wave action) and Zone X (500-year floodplain). It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Impacts have included flooding of hundreds of homes, schools, and roads, including the blockage of I-95 in Ormond Beach during a 2004 flash flood. Flooding and flood-related losses sometimes occur outside of delineated 100 year special flood hazard areas during 500-year storm events or when rain events are exacerbated by strong winds. Changes in topology (and associated water runoff) generally do not impact Volusia County due to its flat terrain.

Water can rise to exceptional levels during hurricane, storm surge, flash flood and thunderstorm conditions. Water levels have historically risen up to 6 feet within southwestern Volusia County following one of these events, with increased water heights for coastal communities due to Florida's semidiurnal tides. Roadway flooding has been seen rising between 1 and 5 feet.

There are a number of areas that are disproportionately affected to flooding, including areas adjacent to the St. Johns River (Maytown to Enterprise).

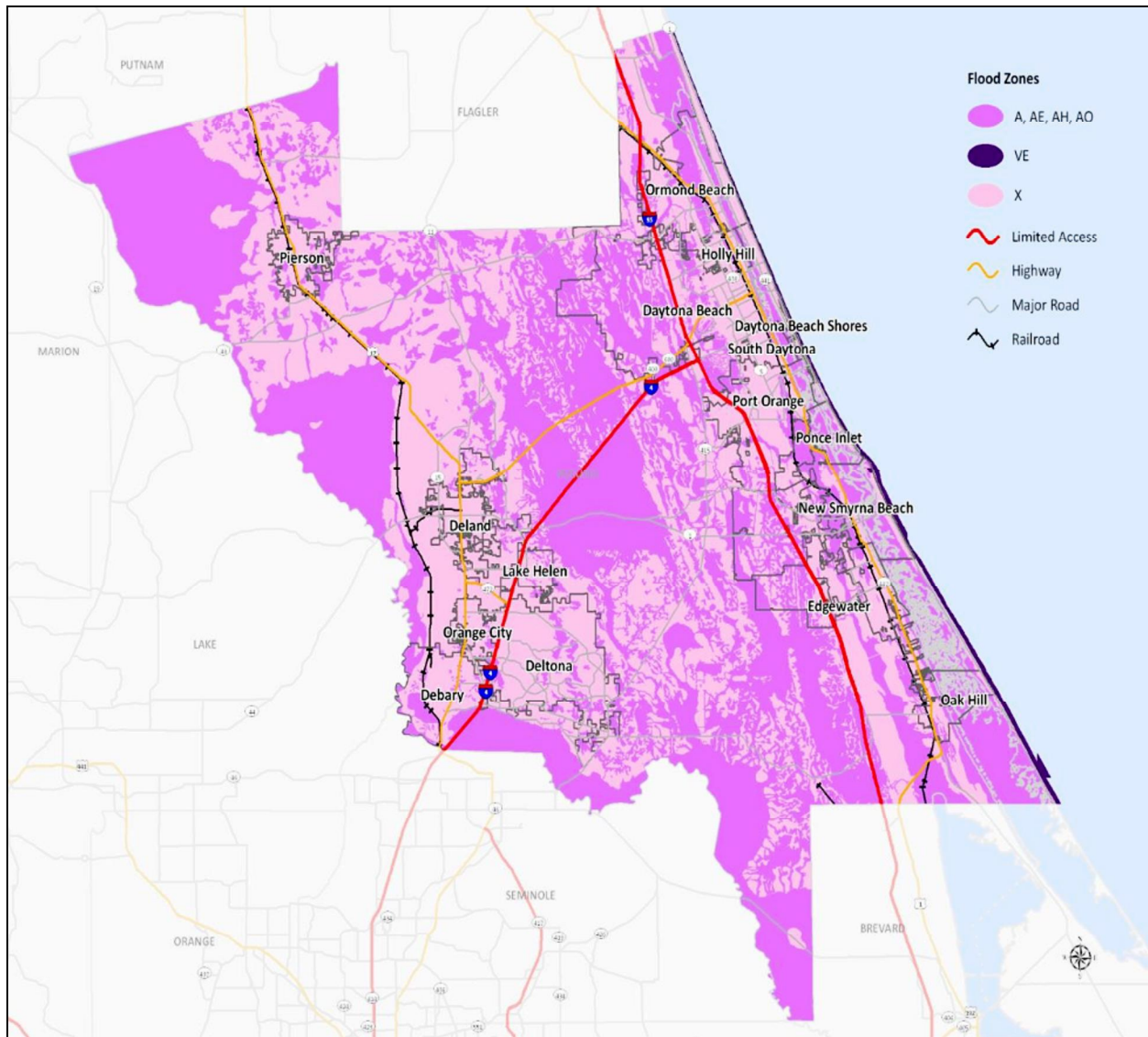
5.10.3 Probability of Future Occurrences

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from flooding and that future mitigation and adaptation strategies related to this hazard should be considered.

¹¹ Storm surge is addressed separately within this section.

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FIGURE 5.10: Special Flood Hazard Areas in Volusia County



Source: Federal Emergency Management Agency --- NOTE: More detailed maps can be found in Appendix I (FMP).

5.10.2 Historical Occurrence

According to the National Climatic Data Center, there have been 12 reported flood events in Volusia County since 1974. According to the data as shown in Table 5.1, there was over \$20 million in property damage (not including recorded agricultural losses) during this period.

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TABLE 5.14: Historical Flood Impacts in Volusia County

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Peninsular	9/15/24	Flooding	0	\$252,242	Two synoptic-scale systems, one tropical and one non-tropical brought heavy rain to most of peninsular Florida the last half of September. Other sections of Florida, particularly northeast and east central, experienced urban flooding which closed roads and flooded schools and homes in Duval County and flooded subdivisions in Flagler, Volusia, St. Johns and Alameda counties.
Countywide	10/11/24	Flood	0	\$252,242	Heavy rains across much of northeast Florida caused widespread flooding of roadways and vehicles and minor flooding of schools, businesses and residences. Strong onshore winds caused significant beach erosion and minor coastal flooding along portions of the northeast coast.
Oak Hill	9/21/22	Flash Flood	0	\$12,422	Heavy rain of 2 to 4 inches produced flooding in Oak Hill. Two homes had minor flooding.
Edgewater	9/14/2001	Flash Flood	0	\$16,622	Rainfall from Tropical Storm Gabrielle flooded about 25 homes and apartments in Edgewater and New Smyrna Beach. About 5 homes were flooded along the Tomoka River in Daytona Beach. Roadway and small stream flooding was reported over much of the county.
Ponce Park	11/14/2001	Flash Flood	0	\$622,225	Showers and thunderstorms dumped over 5 inches of rain in coastal sections of Volusia County. Thirty-five homes in the Ponce Inlet, Daytona Beach and Ormond by the Sea areas received some water damage.
Deltona	9/21/2002	Urban Flood	0	\$0	Thunderstorms produced street flooding in Deltona.
Ormond Beach	9/22/2004	Flash Flood	0	\$0	Heavy rain in the morning hours brought 24-hour rain totals to near 2 inches. Widespread street flooding with water in two homes in Ormond Beach was reported. A lane of Interstate 5 was blocked by flood waters.
Countywide	9/25/2004	Flash Flood	0	\$0	From 10 to 12 inches of rain from the northern rain bands of Hurricane Frances produced widespread flooding of homes, businesses and roads across coastal communities as well as in Deltona, and Deland.
Countywide	9/22/2004	Flood	0	\$5,564,516	Hurricane Frances produced 6 to 10 inches of heavy rain over much of the middle and upper St. Johns River basin. Beginning on September 22th, water levels began to reach flood stage on the middle basin mainly around Geneva, and Sanford. Levels continued to rise well above flood stage and began to fall slightly until Hurricane Jeanne followed the same track across the state. Significant flooding followed with a record crest of 10.1 feet being reached at the Lake Harney Gage. Many homes were flooded near Stone Island.

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TABLE 5.14: Historical Flood Impacts in Volusia County

LOCATION	DATE	TYPE	DEATHS/ INJURIES	PROPERTY DAMAGE (2009 dollars)	DESCRIPTION
Countywide	2004	Flash Flood	0	\$12,400,000	As Tropical Storm Fay drifted north in the Volusia County off shore waters, hours of torrential rain fell across southern Volusia county. Close to 200 homes were flooded. Damage was near \$12 million. Torrential rain from Tropical Storm Fay produced widespread flooding across Sevier and central and southern Volusia counties.
Deltona	5/21/2004	Flood	0	\$62,600,000	Multiple rounds of heavy rainfall over five days led to several feet of standing water in many areas of eastern Volusia County. Rainfall totals reached 12 to 22 inches in several coastal areas.
Ormond Beach	5/22/2004	Flash Flood	0	\$2A	High levels of pre-existing flood waters were exacerbated as two to four inches of additional rainfall occurred in less than three hours. Standing water rose to three feet or higher in several locations. Flood waters entered additional homes. Flash flood damage estimates were included collectively in the five-day flood event from May 12-24.
Isleboro	2/22/2014	Flash Flood	0	\$562,000	A very moist atmosphere coupled with a series of upper level disturbances resulted in several persistent rain bands. Significant urban and small stream flooding affected portions of Melbourne, Palm Bay and Lake Mary, Winter Park. Flash flooding resulted in rapid water accumulation in New Smyrna Beach and from Holly Hill to Daytona Beach to Port Orange, where numerous roadways became impassible and over 100 homes sustained damage from the rising flood waters. Rainfall totals during the 24-hour period of greatest impact reached 6-12 inches. Flood damage estimates within Volusia County was \$1.65 million dollars. No injuries reported.
Holly Hill	2/24/2014	Flash Flood	0	\$2,020,000	Same as above.
Ormond-by-the-Sea	10/26/2016	Flood	0	\$0	Associated with Hurricane Matthew (see Hurricanes)
Seville	2/10/2017	Flood	0	\$0	Associated with Hurricane Irma. (see Hurricanes)
Ormond-by-the-Sea	11/22/2017	Flood	0	\$0	A strong thunderstorm embedded within a rain area ahead of a cold front intensified as it traveled quickly northeast across Volusia County. Mobile homes were damaged well inland in Deland, then over 20 minutes later, the storm damaged mobile homes in Daytona Beach.

Source: National Climatic Data Center

NOTE: ALL HISTORICAL OCCURRENCES IN THIS REPORT ARE THE MOST RECENT AS AVAILABLE
 THE ATLANTIC CLIMATIC DATA CENTER

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According to the emergency management officials from the Volusia County jurisdictions, another significant flood event occurred during the Memorial Day Weekend in May 2004 that was not included in the FIC database. This event caused high rains and four feet of storm surge. There was between approximately \$60 million in damages along the coastline from Ormond Beach to New Smyrna Beach. Approximately 1,000, infrastructure and various critical facilities were damaged. Daytona Beach, alone, had approximately 650 damaged homes.

5.10.4 Historical Summary of Insured Flood Losses

All jurisdictions in Volusia County participate in the National Flood Insurance Program (NFIP). **Table 5.15** provides flood insurance policy and claim summary information for each of the participating jurisdictions. The reported losses include both inland (freshwater) and coastal flooding events. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood losses in Volusia County were either uninsured, denied claims payment, or not reported.

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TABLE 5.15: NFIP Policy and Claim Information (May 2017)

JURISDICTION	NUMBER OF LOSSES REPORTED	TOTAL PAYMENTS
Daytona Beach	22	\$202,421
Daytona Beach Shores	6	\$11,024
Deary	12	\$202,222
DeLand	102	\$222,552
Deltona	46	\$222,242
Edgewater	22	\$22,202
Holly Hill	12	\$252,162
Lake Helen	0	\$0
New Smyrna Beach	244	\$2,221,222
Pak Hill	10	\$2,024
Range City	6	\$6,020
Rmond Beach	220	\$4,541,152
Pierson	1	\$2,224
Ponce Inlet	2	\$22,201
Port Range	66	\$222,252
South Daytona	11	\$22,240
Volusia County	201	\$2,615,222
TOTAL	1,334	\$14,364,775

Source: V.C.E.M. (125155 Historical Claims Spreadsheet) (May 2017)

5.10.5 Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1992. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 122,000 repetitive loss properties nationwide.

According to Volusia County repetitive loss property records (as of July 2017), there are 22 repetitive loss properties located in Volusia County. Without mitigation, these properties will likely continue to experience flood losses. In 2012, the Biggert Waters Flood Insurance Reform Act eliminated the RFC program. **Table 5.16** provides summary information about repetitive loss properties in Volusia County.

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JURISDICTION	NUMBER OF RL PROPERTIES	
	TOTAL	LOSSES TO LAND USE
Daytona Beach	2	2 RESIDENTIAL
Daytona Beach Shores	0	0
DeBary	0	0
DeLand	10	10 RESIDENTIAL
Deltona	0	0
Edgewater	1	1 RESIDENTIAL
Holly Hill	1	1 RESIDENTIAL
Lake Helen	0	0
Law Smyrna Beach	12	12 RESIDENTIAL
Lake Hill	0	0
Orange City	0	0
Ormond Beach	24	24 RESIDENTIAL
Pierson	0	0
Ponce Inlet	0	0
Port Orange	4	4 RESIDENTIAL
South Daytona	2	2 RESIDENTIAL
Volusia County	12	12 RESIDENTIAL
TOTAL	22	22 RESIDENTIAL

Source: V.C.E.M, Volusia County I.T.

5.10.2 Probability of Future Occurrences

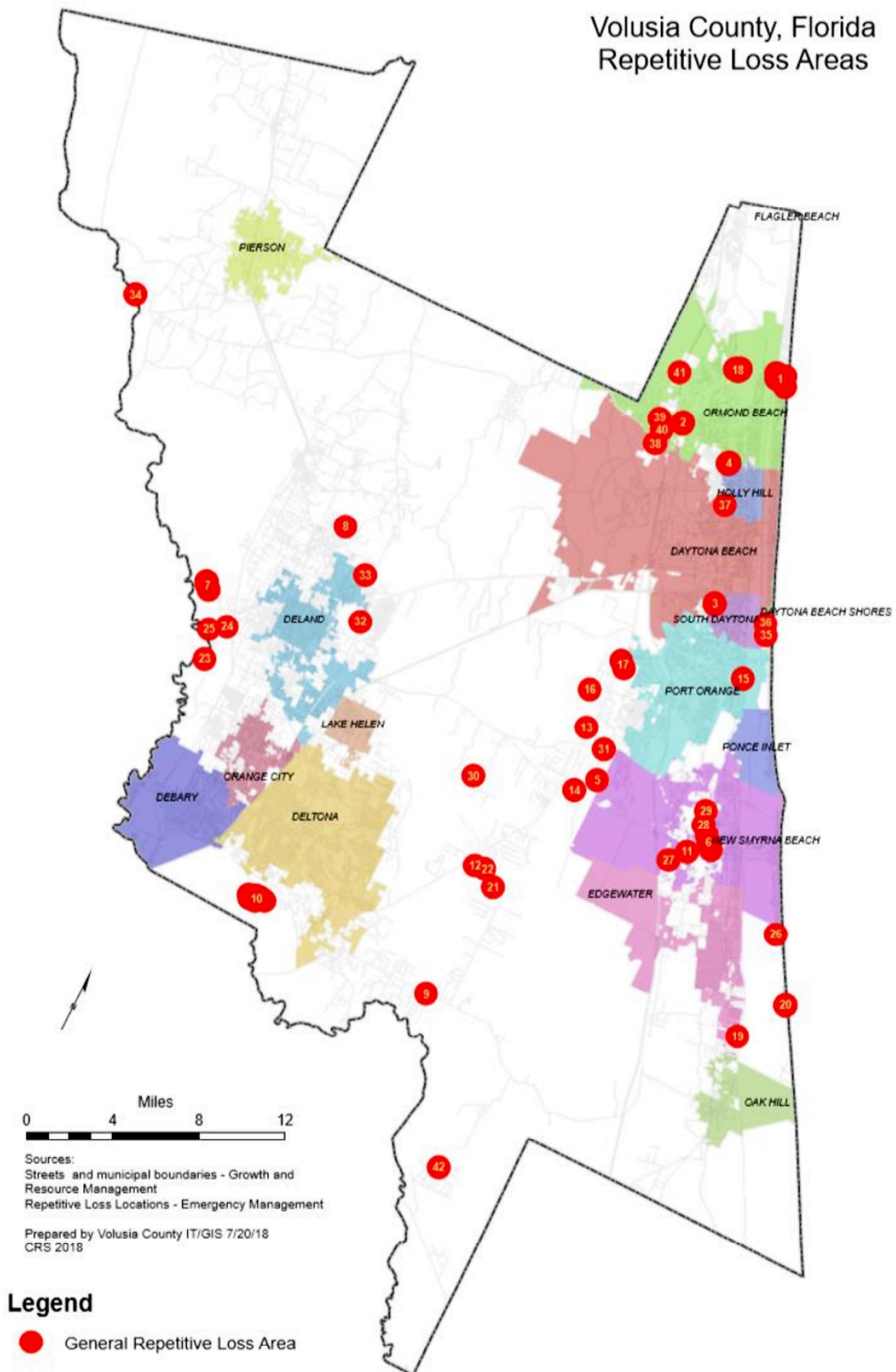
Flood events will remain a frequent occurrence in Volusia County, and future probability of occurrences is high. The probability of future flood events based on magnitude and according to best available data is illustrated in Figure 5.10, which indicates those areas susceptible to the 1 percent annual chance flood (100-year floodplain); the 1 percent annual chance flood with wave action (100-year coastal floodplain); and the 0.2 percent annual chance flood (500-year floodplain). Further, as described in other hazard profiles, it is highly likely that Volusia County will continue to experience inland and coastal flooding associated with large tropical storms, hurricanes and storm surge events.

Anticipated sea level rise will increase the probability and intensity of future tidal flooding. Rising sea level over time will decrease the return period (increasing the frequency) of significant flood events. For example; sea level rise of 1 foot over a typical project analysis period (50 years) may cause a flood event currently of annual probability 2 percent (50-year flood) to become an event of 10 percent annual probability (10-year flood). This rise in sea level will increase the probability of the loss of coastal wetlands and erosion of sand beaches that act as protective buffers against flood events.

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There are repetitive loss properties within 7 of the 16 jurisdictions within Volusia County. This includes 22 total properties. Countywide distribution of repetitive loss properties is somewhat weighted to the east, as a majority of the repetitive loss properties in the county are in the Daytona Beach, New Smyrna Beach and Ormond Beach areas. The western side of the county also has a number of repetitive loss properties, most notably the cluster within the Stone Island residential area in the southwestern portion of the county. Table 5.16 analyzes the Repetitive properties by jurisdiction. Data collected showed that the majority of properties have not undergone mitigation efforts; however, there is insufficient data to measure an actual percentage for the entire county. Preliminary findings show, with a high degree of confidence, that the percent of repetitive loss properties that have been mitigated is well-below the 50% level.

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SECTION 5: HAZARD PROFILES

5.11 STORM SURGE

5.11.1 Background

Storm surge occurs when the water level of a tidally influenced body of water increases above the normal astronomical high tide and is most common in conjunction with coastal storms with massive low-pressure systems with cyclonic flows such as hurricanes, tropical storms and nor'easters. The low barometric pressure associated with these storms causes the water surface to rise, and storms making landfall during peak tides have surge heights and more extensive flood inundation limits. Storm surges will inundate coastal floodplains by dune overwash, tidal elevation rise in inland bays and harbors, and backwater flooding through coastal river mouths. The duration of a storm is the most influential factor affecting the severity and impact of storm surges.

A storm surge is often described as a wave that has outrun its generating source and become a long period swell. It is often recognized as a large dome of water that may be 50 to 100 miles wide and generally rising anywhere from four to five feet in a Category 1 hurricane to over 20 feet in a Category 5 storm. The storm surge arrives ahead of the storm center's actual landfall and the more intense the storm is, the sooner the surge arrives. Water rise can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas. The surge is always highest in the right-front quadrant of the direction in which the storm is moving. As the storm approaches shore, the greatest storm surge will be to the north of the low-pressure system or hurricane eye. Such a surge of high water topped by waves driven by hurricane force winds can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate shoreline.

Storm surge heights and associated waves are dependent on not only the storm's intensity but also upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. The storms that generate the largest coastal storm surges can develop year-round, but they are most frequent from late summer to early spring.

5.11.2 Location and Spatial Extent

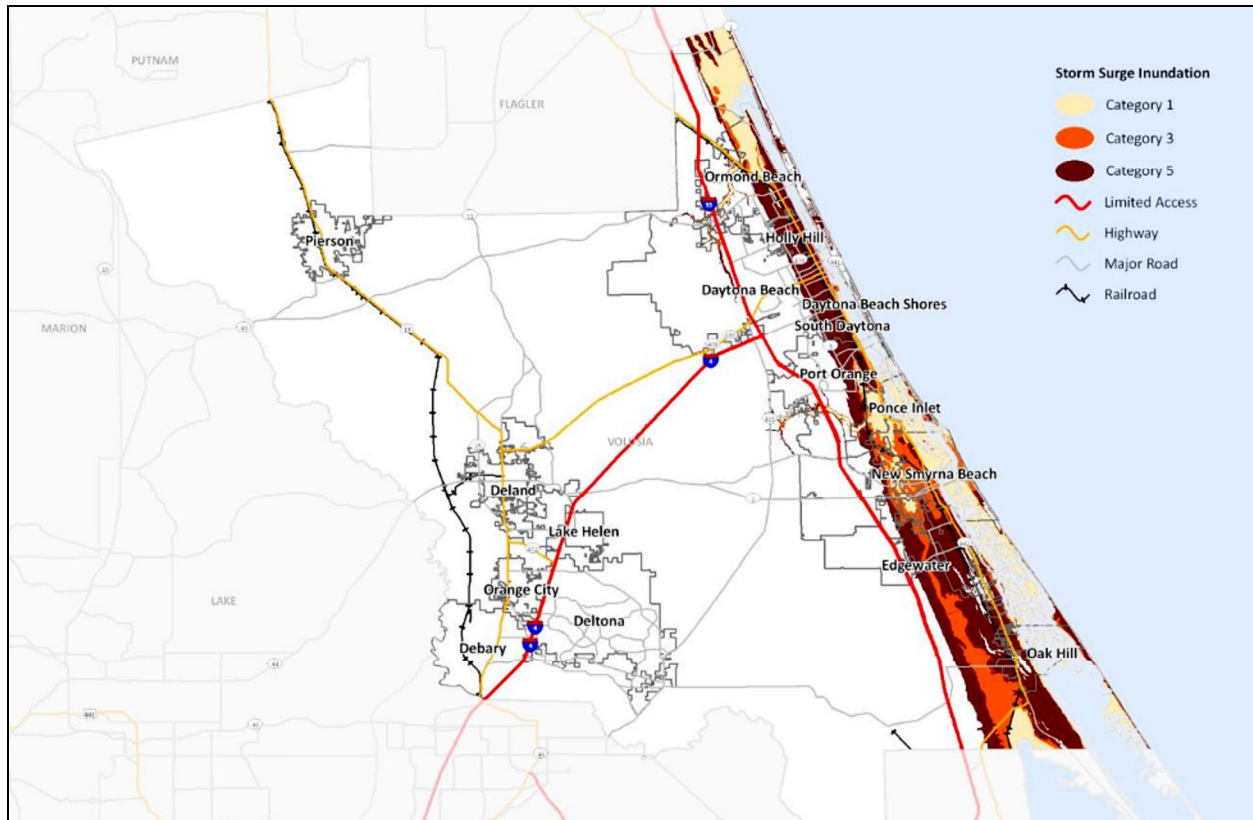
Many areas in Volusia County are subject to potential storm surge inundation. **Figure 5.11** illustrates hurricane storm surge inundation zones for Volusia County derived from geo-referenced SL@SH (Sea, Lake and @verland Surge from Hurricanes) data produced by the USACE in coordination with @@AA. SL@SH is a modeling tool used to estimate storm surge for coastal areas resulting from historical, hypothetical or predicted hurricanes taking into account maximum expected levels for pressure, size, forward speed, track and winds. Therefore, the SL@SH data is best used for defining the potential maximum surge associated with various storm intensities for any particular location.

As shown in the figure, all of Volusia County's coastal areas are at high risk to storm surge inundation in addition to most riverine floodplains along major rivers in southern portions of the area. While areas not located immediately along the coast or major rivers may not be directly impacted by storm surge

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inundation except in extreme storm events, they might experience flooding caused by storm surge and extremely high tides that affect the drainage of areas further inland.

FIGURE 5.11: Storm Surge Inundation Zones in Volusia County



Source: National Oceanic and Atmospheric Administration Note: More detailed map available in next section of the report. See Table 5.4 on page 5.15 for information regarding storm surge extents, in feet.

Ranges include:

Tropical Storm: 0-2 feet
 Category 1: 3-5 feet
 Category 2: 6-8 feet
 Category 3: 9-12 feet
 Category 4: 13-18 feet
 Category 5: 19 or more feet.

5.11.3 Historical Occurrences

Volusia County has experienced storm surge events associated with hurricanes, nor'easters and tropical storms. Please reference the **Hurricane Historical Occurrences** listing for more information. Water can rise to exceptional levels during hurricane, storm surge, flash flood and thunderstorm conditions. Water levels from storm surge have historically risen up to 6 feet within Volusia County following one of these events, with increased water heights for coastal communities due to Florida's semidiurnal tides. Roadway flooding has been seen rising between 1 and 5 feet.

SECTION 5: HAZARD PROFILES**5.11.4 Probability of Future Occurrences**

There is a high probability that Volusia County will continue to experience storm surge associated with large tropical storms, hurricanes and squalls combined with high tides, based on the frequency of past tropical cyclones. As noted in the preceding section (under *Flood*), anticipated sea level rise will increase the probability and intensity of future storm surge events. This rise in sea level will increase the probability and intensity of tidal flooding events, but will also contribute to the loss of coastal wetlands and erosion of sand beaches that act as protective buffers against storm surge events.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hurricanes that future mitigation and adaptation strategies related to this hazard should be considered.

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5.12 SEA LEVEL RISE

5.12.1 Background

Sea level rise is caused by warming of the earth's climate, the associated thermal expansion of water molecules, and generally impacts coastal, lagoon-adjacent and river-adjacent areas that are hydrologically connected to the ocean.

Sea level rise has been assessed in depth by Volusia County Emergency Management as well as numerous municipalities in Volusia County through the development of the East Central Florida Regional Resiliency Action Plan and the East Central Florida Regional Resiliency Collaborative. As part of these efforts, municipalities have held discussions, workshops and meetings to determine consistencies in modeling of sea level rise (including adoption of the "high" 100-year curve as a standard bearer for risk analyses), methods of mitigation including green and gray infrastructure, and other items. These conversations are still ongoing.

Sea level rise is currently impacting south and central Florida, with nearshore, high-tide flooding becoming a more frequent sea level rise-associated hazard in some locations.

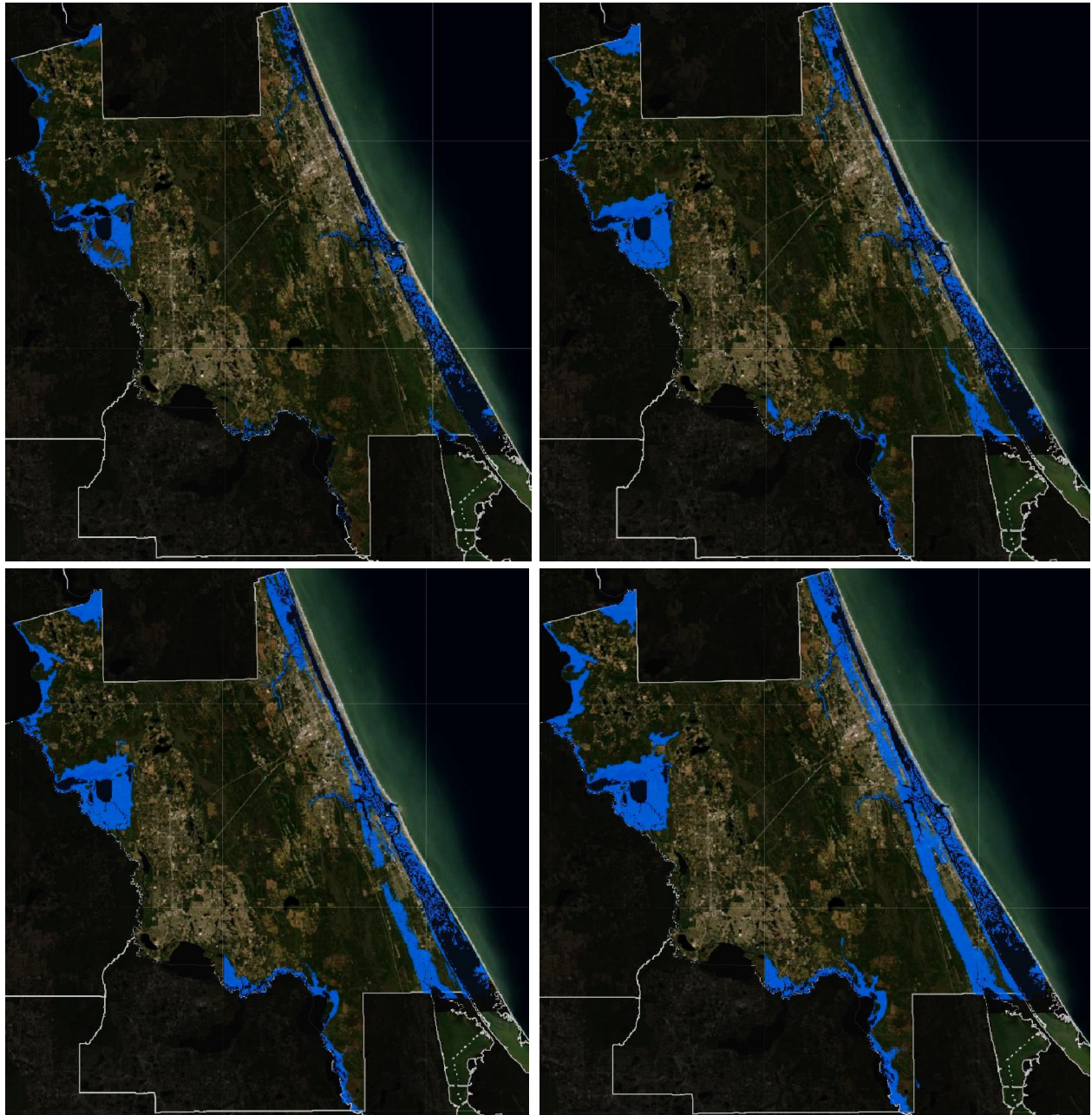
5.12.2 Location and Spatial Extent

The map on the following page depicts 1, 2, 5 and 10-feet of sea level rise overlaid with Volusia County. These levels of sea level rise are within the general range of the sea level rise curves provided by the U.S. Army Corps of Engineers and the National Oceanographic and Atmospheric Administration in section 5.12.4. This data was developed by the Tampa Bay Regional Planning Council and the East Central Florida Regional Planning Council in 2017, with peer review by the University of Florida GeoPlan Center.

In Volusia County, areas susceptible to sea level rise include areas in close proximity to the Atlantic Ocean, the Indian River Lagoon, the Halifax River, the St. Johns River, and smaller riverine systems that provide hydro connectivity into the interior of the County.

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FIGURE 5.12.1: Sea Level Rise Extents in Volusia County (1 ft, 3 ft, 5 ft, 7 ft)



Top Left: 1 Foot

Top Right: 3 Feet

Bottom Left: 5 Feet

Bottom Right: 7 Feet

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5.12.3 Historical Occurrences

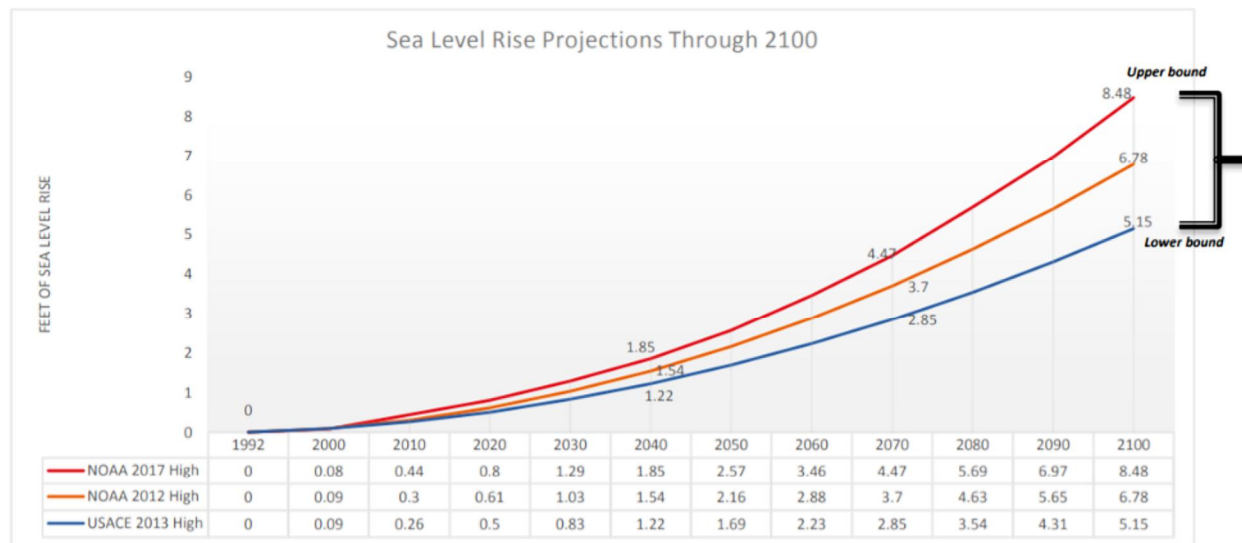
Historical occurrences of sea level rise are not easy to measure due to a lack of data existing from the early 20th Century as well as the time period of two epochs (22 years) needed to calculate the mean impacts of sea level rise, by location. As data collection and monitoring improve, the ability for the County to track historical occurrences will improve.

One indicator of sea level rise is the frequency of nearshore, high tide flood events, also known as nuisance flooding. In 2016, a NOAA study found that nuisance flooding frequency was increasing to the north and south of Volusia County (in Mayport, FL; Fernandina Beach, FL; and Key West, FL). It is expected that these events will continue to increase in frequency in the future.

5.12.4 Probability of Future Occurrences

The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers have published numerous sea level rise curves that project the future impacts of sea level rise, in feet. The following sea level rise curves are being used to assess the potential impacts of sea level rise by municipalities in Volusia County.

Figure 5.12.2



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GEOLOGIC HAZARDS

5.13 SINKHOLE

5.13.1 Background

Sinkholes are a natural and common geologic feature in areas with underlying limestone and other rock types that are soluble in natural water. Most limestone is porous, allowing the acidic water of rain to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosional process can create extensive underground voids and drainage systems in much of the carbonate rocks. Collapse of overlying sediments into the underground cavities produces sinkholes.

The three general types of sinkholes are: subsidence, solution, and collapse. *Subsidence sinkholes* form gradually where the overburden (the sediments and water that rest on the limestone) is thin and only a veneer of sediments is overlying the limestone. *Solution sinkholes* form where no overburden is present and the limestone is exposed at land surface. *Collapse sinkholes* are most common in areas where the overburden is thick, but the confining layer is breached or absent. Collapse sinkholes can form with little warning and leave behind a deep, steep-sided hole. Sinkholes occur in many shapes, from steep-walled holes to bowl or cone shaped depressions. Sinkholes are dramatic because the land generally stays intact for a while until the underground spaces get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur. Under natural conditions, sinkholes form slowly and expand gradually. However, human activities such as dredging, constructing reservoirs, diverting surface water and pumping groundwater can accelerate the rate of sinkhole expansions, resulting in the abrupt formation of collapse sinkholes.

Although a sinkhole can form without warning, specific signs can signal potential development:

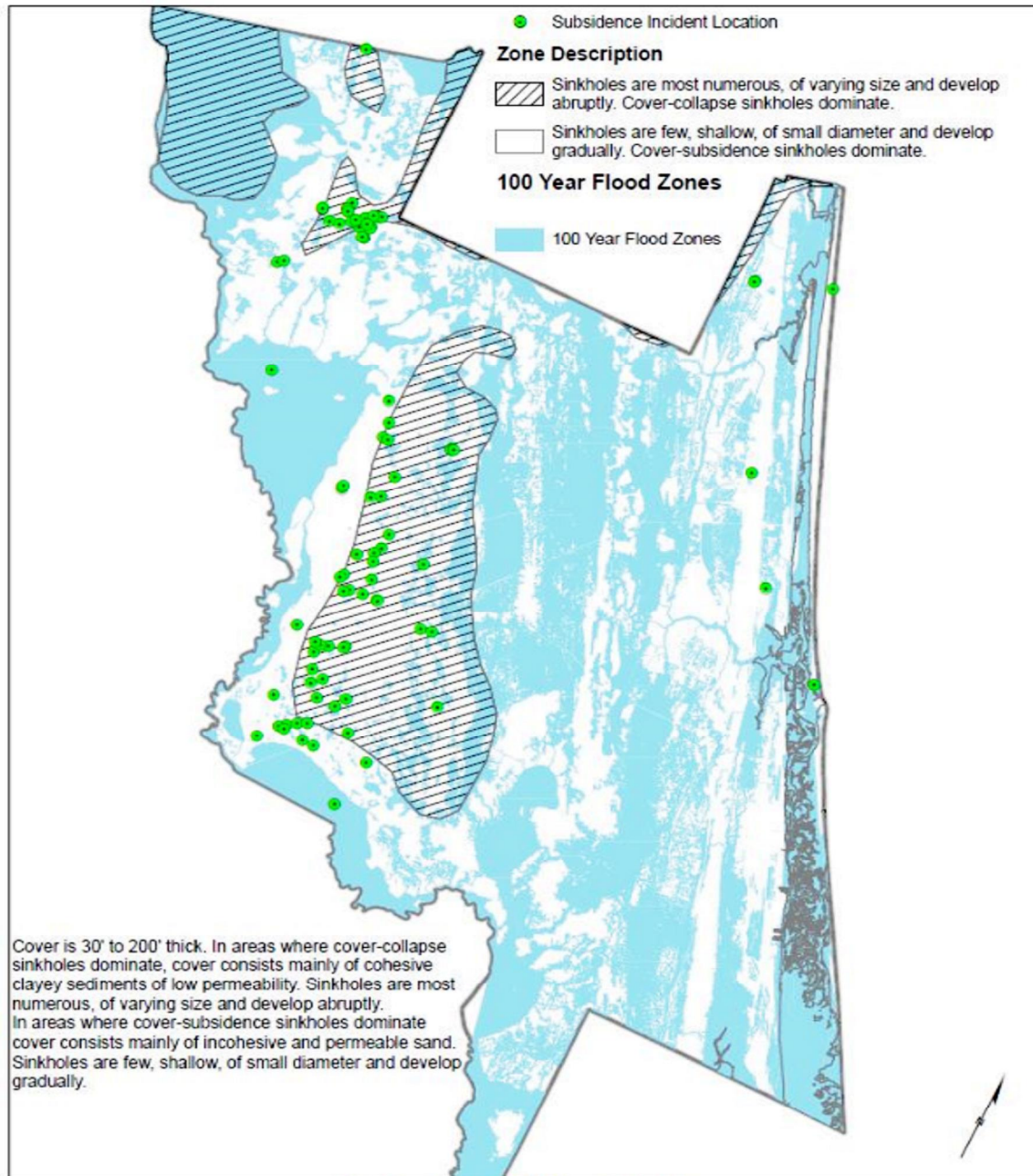
- Slumping or falling fence posts, trees or foundations;
- Sudden formation of small ponds;
- Wilting vegetation;
- Discolored well water; and/or
- Structural cracks in walls, floors.

Sinkhole formation is exacerbated by urbanization. Development increases water usage, alters drainage pathways, overloads the ground surface and redistributes soil. According to FEMA, the number of human-induced sinkholes has doubled since 1990 and insurance claims for damages as a result of sinkholes has increased 1,200 percent from 1999 to 2011, costing nearly \$100 million.

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5.13.2 Location and Spatial Extent

Sinkholes are typically localized occurrences that cannot be mapped to any specific geographic boundaries. The map below (figure 5.13.1) depicts sinkhole locations within Volusia County, Florida. Cities and towns most impacted by sinkholes include Deltona, Orange City, DeBary, DeLand, and Pierson.



Volusia County, Florida
Sinkhole Incidents / Sinkholes - January 1973 to January 2013

Source: Subsidence Data - FL Geological Survey, October 2014; Sinkhole Zone Data - FL DEP, 2010; Flood Zone Data - FEMA Feb 2014.
 Prepared by Volusia County IT/CIS March 24, 2015

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The American Society of Civil Engineers measured a number of Florida sinkholes and concluded that their sample had average depth of 7.4 meters (11.2 feet). This figure is geographically relevant to Volusia County; however, the breadth of size of sinkholes can vary widely depending on the context of the earth subsurface. Sinkholes can be relatively shallow (less than two meters) or extremely deep (tens of meters), and therefore can have extremely large or small diameters, ranging in size from one-to-two meters to tens of meters.

5.13.3 Historical Occurrences

There were 20 sinkholes in Volusia County between 1999 and 2005. **Figure 5.12** shows the location of these sinkholes. Seventy-eight of these sinkholes were located in the Volusia County study area as shown in **Table 5.17**, as reported to the FDOT. In 2004 there was a major sinkhole that occurred in Deland. In December 2004, a sinkhole devoured a 160-foot area, swallowing all four lanes of Howland Boulevard, cracked the walls of a nearby home and caused the evacuation of 20 homes. It was estimated that it would take 1 million cubic yards of dirt to fill the hole. In 2005, a 250 foot by 150-foot sinkhole opened in Volusia County, and sinkholes with depths as great as 50 feet have been observed within the County. These conditions can be expected in the future within Volusia County

Please reference the sinkhole portion of section 6 for a map depicting all historical sinkhole locations in East Central Florida.

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
Pierson	12/12/1999	60.00	60.00	0.00	There are many small lakes in the area. The sinkhole was adjacent.
Pierson	12/17/1999	100.00	100.00	40.00	Depth varies from 20' to 40'. It happened during pumping for freeze protection.
Pierson	12/17/1999	10.00	10.00	2.00	One
Pierson	12/15/1995	25.00	25.00	20.00	It happened during pumping for freeze protection.
Pierson	1/10/1996	7.00	7.00	1.00	It happened during pumping for freeze protection.
Pierson	12/17/1996	15.00	15.00	0.00	One
Pierson	1/15/1999	0.00	0.00	0.00	One
Pierson	1/17/1999	20.00	20.00	12.00	Near other small sinks and lakes.
Orange City	4/10/1999	20.00	20.00	50.00	Near 501
Pierson	1/27/1999	22.00	22.00	0.00	One
Pierson	1/27/1999	22.00	22.00	2.00	One
Pierson	1/27/1999	17.00	16.00	2.00	One

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
DeLand	4/1/1999	6.00	6.00	10.00	One
DeLand	1/99	2.00	2.00	4.00	One
DeLand	2/16/1991	12.00	12.00	12.00	One
DeLand	10/22/1991	2.00	2.00	2.00	One
Pierson	12/15/1991	50.00	50.00	20.00	A sink also occurred here in 1/99.
Orange City	1/22/1992	2.00	2.00	2.00	One
DeBary	4/22/1992	20.00	20.00	15.00	One
DeLand	4/11/1992	2.25	6.50	2.22	One
DeLand	4/14/1992	2.00	2.00	1.00	Occurred at the national guard armory.
Lake Helen	2/25/1992	4.00	2.00	2.00	One
Orange City	10/4/1992	12.00	12.00	6.00	One
Holly Hills	4/22/1992	20.00	0.00	15.00	One
New Smyrna Beach	5/22/1992	5.00	0.00	2.00	There are multiple holes in the area varying from 1 to 5 feet in diameter and 2 to 2 feet deep.
Pierson	12/26/1992	120.00	100.00	25.00	One
Pierson	12/26/1992	50.00	50.00	25.00	Very cold at this time, pumping for freeze protection.
Pierson	12/26/1992	10.00	10.00	0.22	Very cold at this time, pumping for freeze protection.
Pierson	12/26/1992	15.00	15.00	0.60	Very cold at this time, pumping for freeze protection.
Pierson	12/26/1992	25.00	25.00	20.00	Very cold at this time, pumping for freeze protection. Occurred next to a fernery.
Orange City	4/24/1994	2.00	2.00	6.00	Approximately 200 yards from ST 12-22, in the center of the west bound lane.
Seville	1/21/1995	60.00	60.00	25.00	Many wells in the area went dry. Sink in the northeast corner of Crystal Lake which has been dry for months. Six days later, the sink was filled with water, but no rain. Heavy freeze protection pumping at this time.
Pierson	1/21/1995	20.00	20.00	2.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Pierson	1/21/1995	10.50	12.25	4.00	Six Sinks in the area. Heavy freeze

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
					protection pumping at this time.
Pierson	1/21/2005	62.00	62.00	15.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Pierson	1/21/2005	50.00	50.00	12.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Pierson	1/21/2005	20.00	26.00	2.00	Six Sinks in the area. Heavy freeze protection pumping at this time.
Orange City	10/21/2005	25.00	25.00	0.10	Settlement causing cracks and distortion to house. The sink is completely under the house. Cement pressure grouting will be performed Jammal and Associates report.
Pierson	1/22/2006	20.20	21.00	0.00	Near other sinkholes.
DeLand	2/21/2006	5.00	4.00	4.50	This sinkhole is on the slope of Lake Louise.
Port Orange	4/22/2007	10.00	10.00	1.00	One
Orange City	5/21/2007	25.00	25.00	1.00	Reactivation of ancient sink.
Pierson	5/22/2007	40.00	20.00	10.00	Sinkhole on divide between stone pond and unnamed pond. .
Pierson	5/22/2007	0.00	0.00	0.00	One
DeLand	7/21/2007	5.50	6.50	11.00	A backhoe operator drove up to the edge of the area and it suddenly collapsed.
DeLand	7/21/2007	10.00	10.00	10.00	S.R. 11 The sink is in the right of way on the west side of the highway.
Orange City	10/22/2011	22.00	22.00	20.00	1010 Clara Ave, residence.
Orange City	2/22/2007	100.00	100.00	25.00	2500 Lansdowne Ave.
Orange City	2/22/2007	15.00	15.00	1.00	560 Marilea Ct.
Orange City	5/22/2004	50.00	50.00	25.00	501 Sparkman Ave
Orange City	7/22/2004	5.00	5.00	1.50	I-4 at the Saxon Boulevard Ramp
DeLand	7/24/2005	10.00	0.00	5.00	Sinkhole is in backyard.
DeLand	1/10/2006	5.00	5.00	2.00	Located at 1000 Reynolds Road.
DeLand	1/10/2006	50.00	50.00	11.00	Located at 1000 Reynolds Road.
Deltona	10/12/2006	0.00	0.00	0.00	Located at a residence.
DeLand	7/20/2007	10.00	10.00	5.00	U.S. HWY 1000 in DeLand located on the east side of the highway in bank driveway.

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
DeBary	5/26/2000	0.00	0.00	0.00	147 MARSELLA Road in a DeBary housing subdivision. One home deemed unsafe and two have structural damage.
Lake Helen	6/14/2000	1.00	1.00	2.00	Located on west Main Street under a home; it is not causing structural damage.
DeLand	7/21/2000	25.00	25.00	15.00	The sinkhole is located under a home that is under construction. No structural damage to home.
Orange City	7/26/2000	2.00	2.00	2.00	Sinkhole is still growing; 20 feet from structure.
Orange City	7/22/2000	2.00	2.00	10.00	Sinkhole is 6 feet from structure. No structural damage on private property.
Sanford	7/27/2000	5.00	5.00	2.00	NEAR STATE 225, Located 5 feet right of Jensen Junction Road.
DeBary	10/17/2000	2.00	2.00	6.00	Located on private property.
Pierson	12/21/2000	50.00	50.00	15.00	Located on Shaw Lake Road between Turner Road and Hilsenbeck Road. Ten feet from South side of the road. . .
Pierson	12/21/2000	20.00	25.00	25.00	A portion of Shaw Lake Road was barricaded due to sinkhole impact.
DeLand	12/22/2000	25.00	25.00	2.00	A sinkhole occurred 50 feet from structure but structure is stable at this time.
DeLand	7/22/2001	6.00	4.00	5.00	Sinkhole was located in the road. A garbage truck hit it. It is now being repaired.
DeLand	4/20/2001	20.00	20.00	2.00	Sink occurred on private property near a retention pond.
DeBary	7/17/2001	4.00	4.00	2.00	Sink on private property.
Welaka	10/15/2001	2.00	2.00	1.50	U.S. 17 North of Seville going southbound.
Orange City	7/25/2002	2.00	2.00	0.00	Closed one lane of road to repair sink in right of way.
Orange City	7/30/2002	6.00	6.00	2.00	Sinkhole in intersection.
Orange City	1/15/2003	5.00	5.00	0.50	Half inch pavement dip.
DeLand	6/22/2004	15.00	15.00	2.00	Sinkhole in the road. No damage or injuries occurred.
DeLand	7/27/2004	4.00	4.00	2.50	Sinkhole on private property; no damage.

SECTION 5: HAZARD PROFILES

TABLE 5.17: Historical Sinkholes in Volusia County

LOCATION	DATE	SIZE (feet)			DETAILS
		Length	Width	Depth	
DeLand	12/22/2004	25.00	25.00	20.00	Sinkhole on private property. The hole is partly under the garage. The owner was advised not to stay in the home until the sinkhole is fixed.
Deltona	12/17/2004	225	175	50	Destroyed 4-lanes of Howland Blvd.; largest sinkhole on record for Volusia County
Orange City	1/22/2005	250.00	150.00	0.00	Sinkhole damaged 2 homes beyond repair and is also impacting road.
DeSteen	2/21/2005	4.00	2.00	2.00	Sinkhole on private property.
Lake Delia	2/21/2005	4.00	4.00	2.00	One

Source: National Climatic Data Center (data not available from this source after-2005)

Volusia County Geographic Information Systems (GIS) has compiled a listing of all sinkholes that have occurred since August 17, 2005. The listing is provided below:

Reference #	Date	Longitude	Latitude	County	City	Trigger
79-544	8/26/08	-81.321	28.8988	VOLUSIA	DeBary	Unknown
79-545	8/27/08	-81.2517	28.8975	VOLUSIA	Deltona	Unknown
79-546	10/2/08	-81.0583	29.206	VOLUSIA	Daytona Beach	Unknown
79-547	10/9/08	-81.2271	28.8838	VOLUSIA	Deltona	Unknown
79-044	10/13/08	-81.2665	28.9198	VOLUSIA	Deltona	Excessive Rainfall
79-548	7/2/11	-81.07076	29.3563	VOLUSIA	Ormond Beach	Unknown
79-549	1/24/13	-81.338	29.10877	VOLUSIA	DeLeon Springs	Drought or Low Water Table

5.1 . Proaility of Future Occurrences

There is a high probability of future sinkhole occurrences in Volusia County. The county averages 2.5 sinkholes annually, according to the historic data. Activities that increase the risk of sinkhole are ground-water pumping, construction and development practices, and breakages in water lines, though they can also occur due to natural or geological factors. The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from hail and that future mitigation and adaptation strategies related to this hazard should be considered.



SECTION 5: HAZARD PROFILES

5.1 TSUNAMI

5.1 .1 Background

The word tsunami is Japanese and means “harbor wave.” A tsunami is a wave or series of waves most commonly caused by an earthquake or by a large undersea landslide, volcanic eruption or other undersea disturbance. From the area of disturbance, tsunami waves will travel outward in all directions and can originate hundreds or even thousands of miles away from affected coastal areas.

In the open ocean, tsunami waves travel at speeds of up to 600 miles per hour but are too small to be observed, and the time between wave crests may be five to 10 minutes. As the waves approach shallow coastal waters, they slow down and may rise to several feet or, in rare cases, tens of feet. Although the waves slow down as they reach shallow water, the energy remains constant and when tsunami waves crash into the shoreline they may be as high as 100 feet. The first wave is almost never the largest; successive waves may be spaced tens of minutes apart and continue arriving for many hours. The coastal areas at greatest risk are less than 50 feet above sea level and within one mile of the shoreline. Tsunamis can cause great loss of life and property damage where they come ashore, and most tsunami deaths are the result of drowning. Associated risks include water pollution, damaged gas lines, and flooding.

Tsunami activity is a greater risk along the Pacific Rim states (Washington, Oregon, California Alaska and Hawaii), but is still possible along the East Coast of the United States. In fact, as many as 40 tsunami or tsunami-like events have been reported along the East Coast since the early 1600s. Additionally, models and methodologies do not currently exist to accurately assess the tsunami hazard as it would relate to an inland community along the East Coast.

Although an East Coast tsunami would be rare, two off-shore areas are currently under investigation according to a 2002 National Geophysical Data Center report. One area of interest consists of large cracks northeast of Cape Hatteras, North Carolina that could foretell of the early stages of an underwater landslide resulting in a tsunami. The other area of interest consists of submarine canyons approximately 150 kilometers from Atlantic City, New Jersey. Significant factors for consideration with regard to these areas are recent discoveries along the East Coast that demonstrate the existence of pressurized hydrates and pressurized water layers in the continental shelf. This has produced speculation among the scientific community on possible triggers that could cause sudden and perhaps violent releases of compressed material that could factor into landslide events and the resulting tsunami waves.

In August 2007, a qualitative tsunami hazard assessment prepared by NOAA and USGS indicated that the U.S. Atlantic coast has a very low tsunami risk¹⁰. This qualitative assessment was based on National Geophysical Data Center (NGDC) and United States Geological Survey (USGS) databases. Specifically, Atlantic coast tsunami vulnerability was deemed very low based on very low wave runup, low tsunami hazard frequency, and no reported fatalities.

NOAA and USGS. 2007. *U.S. States and Territories National Tsunami Hazard Assessment: Historical Record and Sources for Waves*. August 2008.

SECTION 5: HAZARD PROFILES

5.1 . Location and Spatial Extent

The potential location and extent of the tsunami hazard for Volusia County is similar and slightly more extensive than the established flood hazard area. A tsunami event could cover all or any part of Volusia County. However, the coastal areas are most at risk.

Figure 5.1 indicates the areas in Volusia County most at risk to a tsunami hazard based on the location of the 500 year tsunami inundation zone based on MEMPHIS data. The coastal areas are at the greatest risk to high velocity waves that could cause severe to catastrophic damage to structures and infrastructure. Specifically, massive amounts of vegetative and construction debris would result, boats would be washed ashore, impacted buildings could collapse, trees could be uprooted, above ground power poles and lines could collapse, and underground utilities could be unearthed and destroyed. Tsunami size is a function of the intensity of an underlying earthquake (see the Richter scale, below), as well as factors specific to the shape (or bathymetry) where the seismic activity occurs. For example, the Boxing Day tsunami that struck southern Asia in 2004 was located on an elongated ridge within the deep Indian Ocean. The elongation of the ridge considerably increased the linear mileage of coastline that were struck by the tsunami within the northeastern hemisphere and inflicted more damage on some coastlines than others. Below is a figure depicting the Richter Scale.

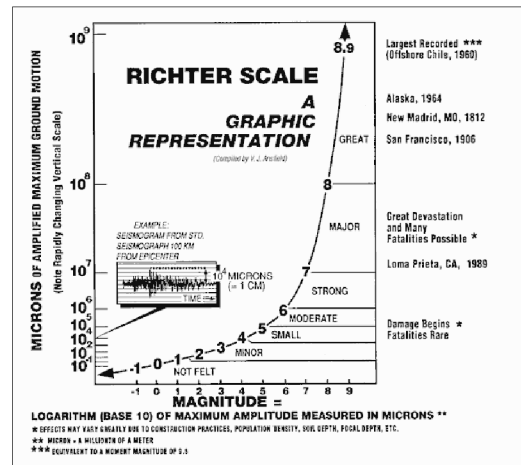
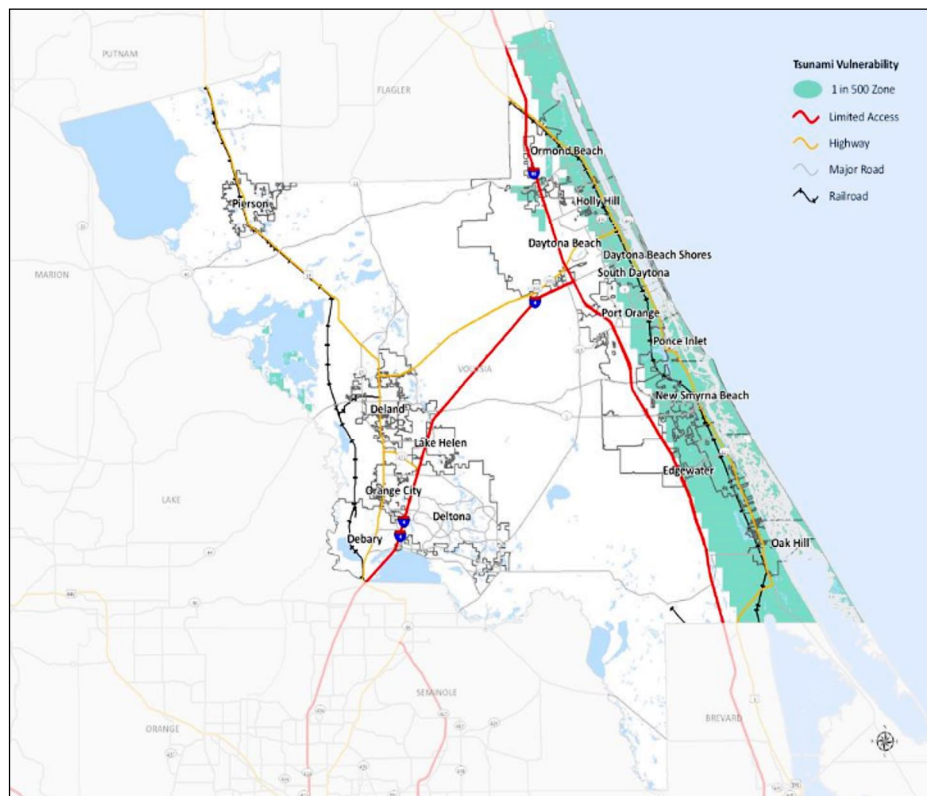


Image: Richter Scale Graphic Representation

FIRE 5.1 : Tsunami Vulnerability Areas



SECTION 5: HAZARD PROFILES

5.14.3 Historical Occurrences

Historical records do not indicate any past significant tsunami occurrences for Volusia County, and such an event is generally considered possible but unlikely. However, the potential for tsunami impacts along the entire Eastern United States coast does exist as evidenced by other recorded tsunami occurrences in the area.

Although different from a tsunami, a rogue wave is a relatively large (i.e., larger in height than a tsunami) and spontaneous ocean wave that can cause similar impacts. On July 1, 1982, a 20-mile-long, 10-foot rogue wave came onshore between Ormond Beach to New Smyrna Beach, centered at Daytona Beach. Sailboats crashed ashore, 200 cars were damaged and approximately 25 people were injured resulting in two hospitalizations. It is theorized that an underwater landslide caused the rogue wave, potentially categorizing this wave as a type of tsunami, or it was the result of a squall line.

5.14.4 Probability of Future Occurrences

The probability of a future tsunami event affecting Volusia County is considered to be very low, as indicated in the 2007 FEMA-USGS tsunami hazards assessment. However, the consequences of even a moderate tsunami striking Volusia County would be devastating to lives, development, and the ability of the county to function.

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from tornadoes and that future mitigation and adaptation strategies related to this hazard should be considered.

SECTION 5: HAZARD PROFILES

OTHER HAZARDS

5.15 WILDFIRE

5.15.1 Background

A wildfire is any fire occurring in a wildland area (i.e. grassland forest, brush land) except for fire under prescription.¹⁰ Wildfires are part of the natural management of forest ecosystems, but may also be caused by human factors. Nationally, over 70 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

There are three classes of wildland fires: surface, ground and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings. Forest damage from hurricanes and tornadoes may also block interior access roads and fire breaks; pull down overhead power lines, or damage pavement and underground utilities.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses and industries are located within high wildfire hazard areas. Further, the increasing demand for outdoor recreation places more people in wild lands during holidays, weekends and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, often experience losses that are passed along to consumers through higher prices. In cases, this has resulted in the loss of jobs. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks and fuel management can be designed as part of an overall fire defense

¹⁰ Prescription burning, or controlled burn, undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

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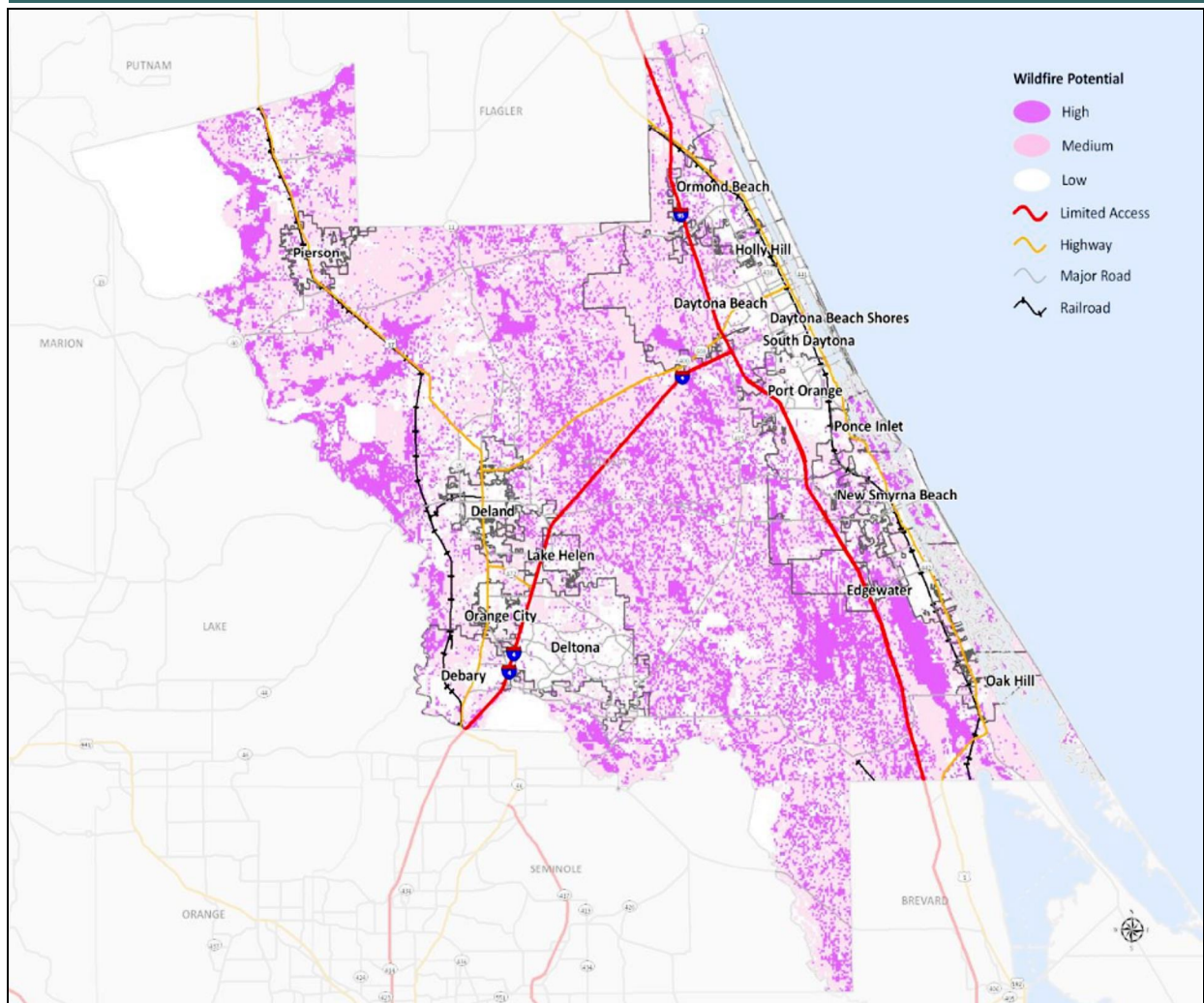
system to aid in fire control. Fuel management, prescribed burning and cooperative land management planning can also be encouraged to reduce fire hazards.

5.15.2 Location and Spatial Extent

Volusia County is uniformly exposed to wildfire risk. Although the county typically receives a high amount of precipitation each year (around 50 inches), there is risk of wildfire due to the hot, dry summer months. Further, drought and drought-like conditions may occur which could increase the probability of wildfire occurrence.

The wildfire potential for Volusia County is shown in **Figure 5.14**. All areas of the county may be susceptible to wildfire, and the wildland-urban interface is an area of concern as more property may be at risk to fire damage in these areas. Further, a large portion of the County is at high risk to wildfire events. These areas are dispersed throughout the County.

FIGURE 5.14: Wildfire Risk in Volusia County



Source: MEMPHIS --- Note: More detailed maps depicting fire risk are available in the next section of the report.

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5.15.3 Historical Occurrences

According to the Florida Division of Forestry, Florida experiences an average of 7,060 wildfires annually, burning nearly 154,000 acres¹⁰. The most common cause of Florida wildfire events is lightning which ignited over 700 fires annually between 2000 and 2007. Volusia County experienced 1,206 fires that burned over 22,600 acres between January 2000 and August 2007. Lightning caused nearly half of these fires. **Table 5.18** lists the number of reported wildfire occurrences in Volusia County between the years 2001 and 2017.

TABLE 5.18: Historical Wildfire Occurrences in Volusia County (2001-2018) *

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	Annual Average
# of Fires	116	21	21	145	64	212	125	121	122	120
Acres Burned	222	221	2,011	246	122	5,022	1,226	1,422	2,222	2,221
YEAR	2010	2011	2012	2013	2014	2015	2016	2017	2018	Annual Average
# of Fires	122	222	202	104	24	104	124	122	122	145
Acres Burned	622	2,252	2,222	1,404	626	222	1,421	1,150	122	2,255

Source: Florida State Fire Marshall Report

It should also be noted that 2007 was a particularly significant year for wildfires in Volusia County. That year, drought conditions were prevalent throughout the County. A total of 222 wildfires were reported, the largest single cause being lightning. In all, over 162,000 acres were burned. The fires threatened 22,000 homes and hindered travel as wildfires jumped highways. However, after weeks of burning, just six houses, one mobile home, and two businesses were destroyed, totaling \$2.1 million (\$2,222,522; 2007 dollars). Timber, conversely, took the brunt of the damage with losses of over \$60 million (\$25,520,222; 2007 dollars). No fatalities or civilian injuries were reported but ten firefighters did have minor injuries.

These events have had devastating impacts on Volusia County. Homes and businesses have been damaged or destroyed, causing economic and social hardship, while a number of agricultural resources (such as timber, as described above) have been lost in these events. Families and vulnerable populations can be displaced temporarily or permanently by these events, while businesses can be lost forever. Human life is also at great risk to fires, as fires can quickly consume buildings and prevent escape. Smoke inhalation is a common cause of death due to fire, rather than the fire itself. Updating and enforcing building codes can help prevent fire disasters.

The largest fire recorded in Volusia County over the last five years was the Iron Horse Fire, which occurred in 2011 in southeastern Volusia County. Approximately 12,000 acres burned during this event, and a full Fire Operations Center (FOC) activation was executed. One mobile home, three outbuildings and three camp structures were destroyed, while 140 total structures were threatened. Interstate 95 was completely shut down due to smoke limiting driver visibility (intermittently over a two-day period), and a firefighter was injured during the event. Also, in 2011, the Maytown Road Fire burned approximately 2,500 acres of land and affected local weather conditions by increasing cloud coverage. In 2012, a number of smaller fires affected the Deland and Delary areas of Volusia County.

Average information based on information between January

SECTION 5: HAZARD PROFILES

In March 2017, the Burrance Road Fire destroyed 1,100 acres and forced evacuations of unincorporated areas of Volusia County near the Flagler County line west of Interstate 5. Approximately 200 homes were evacuated during this event. Interstate 5 from US1 to SR40 was shut down due to smoke.

5.15.4 Probability of Future Occurrences

There is a high probability of future wildfire events in Volusia County, especially during drought cycles and abnormally dry conditions, based on prior occurrence. Volusia County experienced nearly 120 wildfires per year from 2000 to 2007. This vulnerability analysis includes two maps (Wildfire Level of Concern, Wildfire Risk) that depict geographic risk points for fire hazards.

Based on the fire risk maps located in this report, the following acreage of the county is located within areas deemed as high risk and very high risk and could be vulnerable to fire. In terms of approximate burnable acreage within the county, these figures represent the areas at highest risk for a large fire outbreak.

- **High Risk: 4,272,081 acres**
- **Very High Risk: 1,672,519 acres**

The Local Mitigation Strategy recognizes that with a changing climate, there is a potential for an increasing risk of environmental impacts from wildfire and that future mitigation and adaptation strategies related to this hazard should be considered.

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5.16 SOCIETAL, ECOLOGICAL AND TECHNOLOGICAL HAZARDS

5.16.1 Background

There are several hazards that are not a natural function of the Earth's atmosphere and climate within Volusia County, Florida, and these include technological and societal hazards. The environmental, economic and societal implications of the following societal and technological hazards are covered in Appendix H (HIRA Consequences) and Appendix J (Consequences by Hazard) of this report.

- **Cyber Attack**
Cyber-attacks include the use of electronic devices to attack, cripple or damage information systems held by governmental or private institutions, as well as individual citizens.
- **Civil Disturbance**
Civil disturbances can occur due to socio-economic, political or other reasons. These types of events typically occur in public places, including court houses or town civic spaces.
- **Coastal Oil Spill**
While oil spills would primarily affect the Gulf coast of Florida, oil spills can negatively affect tourism and ecological conditions on the Atlantic coast of Florida.
- **Terrorism**
Terrorism includes any attempt to attack, cripple or damage public goods, public infrastructure or citizens on a large scale.
- **Mass Migration**
Mass-migration occurs when persons of one geographic area move in large numbers to another geographic location.
- **HazMat**
Hazardous material (HazMat) includes events when liquid, solid or gaseous chemicals that are harmful or fatal to humans or ecological infrastructure disperse into the atmosphere.
- **Agro-Terrorism**
Agro-Terrorism includes any attempt to maliciously destroy or harm the agricultural industry, the secondary effects of which can be disease, famine and massive economic loss.
- **Public Health Emergencies**
Public health emergencies include medical surges (often from mass casualty events) that require hospitals to act beyond normal capacity. Pandemics are included in this category.
- **Agricultural Infestations**
Agricultural Infestations, Invasive Species, and Diseases Infestation or disease in agriculture is when biological entities such as insects, rodents, bacteria or viruses significantly increase in a given area, affecting crops to the point where human and animal health is threatened, valuable crops may be damaged or significant environmental resources may be lost. Examples of common Volusia infestations are caused by mosquitos, citrus greening, southern pine beetle, Florida Swampwood Termites, rats, or noxious plants like Brazilian Pepper Tree, etc.

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Volusia County has 140,205 acres of land with an "Agricultural" land use designation. In 1999 and 2000, Florida's agricultural community was forced to focus time and resources communicating to the general public about the Mediterranean fruit fly (Medfly) and the control methods used to eradicate the pest when the fly threatened the state's \$26.7 million agriculture industry. The Florida Agricultural Extension is a partnership between the University of Florida Institute of Food and Agricultural Sciences (IFAS), the United States Department of Agriculture (USDA) and county governments in Florida to provide scientific knowledge and expertise to the public through educational programs. Volusia County has cattle farms, citrus orchards, ferneries, and other agricultural enterprises that are vulnerable to infestations and disease. Information on these infestations and diseases is available at <http://www.volusia.org/services/community-services/extension>.

Cattle diseases like Mad Cow, Hartwater, and hoof-and-mouth and citrus disease like Greening and Canker are of concern to Volusia farmers. Coordination with the University of Florida IFAS and Volusia County Extension is the first step in mitigation planning for agricultural infestations and disease. A notable source of information on the distribution of invasive plants, insects, animals and diseases in Volusia can be found at the Early Detection and Distribution Mapping system website, <http://www.eddmaps.org>, known as EDDMapS. The EDDMapS web-based mapping system documents invasive species and disease distribution. The site combines data from other databases and organizations as well as volunteer observations to create a national network of invasive species distribution data that is used by scientists, researchers, land managers, land owners, educators, conservationists, ecologists, farmers, foresters, state and national parks. Florida has ecosystems not found in the other 48 contiguous states, and it also has more non-native species than any state other than Hawaii.

If important natural resources such as mangroves, sea oats, oyster beds, etc. are overrun by invading species, then the county will be more vulnerable to the consequences of all other hazards. With the disappearance of natural barriers, lower impacting hazards will have increasingly stronger impacts on residents, businesses, critical infrastructure and the ability of the County to provide uninterrupted program operations. Faculty members at the University of Florida currently are conducting research and outreach programs to better understand and control these exotic invasive species. Until controls are in place the entire population of Volusia is at risk to the effects of a degrading ecosystem.

With its plant-friendly south temperate/subtropical climate, Florida particularly suffers from the introduction and unchecked growth of exotic plants. Almost half (1,100) of the 2,224 plant species found in Florida have arrived here since European occupation. Since plants are the base of the food chain, exotic "takeovers" can jeopardize plant-dependent wildlife and the whole ecosystem. The Florida Exotic Pest Plant Council (FLEPPC) has identified 152 non-native invasive species that are invading and disrupting native plant communities (2011 list). EDDMapS notes 222 separate invasive plant, animal, and insect species found in Volusia County to date. Many of the listed species are distributed throughout the county and are found in natural and disturbed landscapes.

SECTION 5: HAZARD PROFILES

In Florida, at least 60 species of exotic birds have bred in the wild. Despite this fact, the chance of persisting survival of non-indigenous birds is uncertain. Among those species which have survived and thrived as pests are Muscovy ducks, rock doves, European starlings, house sparrows, and monk parakeets. Though troublesome in other respects, some species (such as feral pigs) are important as prey for native predators (Florida panthers) and serve as an attraction for hunters. However, negative impacts from invasive species include habitat destruction, competition with native species, predation, hybridization, disease and parasites.

Florida mammal pests include the Norway rat, roof rat, house mouse and feral pig. Siting of invasive fish in Volusia include Lionfish, and Nile Tilapia. Annually, insect pests cause an estimated \$1 billion in damages in Florida, and many of the worst pests are non-indigenous. According to entomologist Dr. John Capinera, 1,212 invading species become established in Florida annually. These non-natives arrive by flying, walking, swimming, rafting and by stowing away on cargo (often on infested plants commercially imported).

In top of having profound ecological impacts, invasive species cost Floridians over \$500 million each year; these costs include monitoring, testing, management, eradication, and restoration efforts. The probability of invasive species continuing to impact Volusia County is considered likely, occurring once a year or more.

SECTION 5: HAZARD PROFILES

5.1 CONCLUSIONS ON HAZARD RISKS

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its “How-to” guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 446-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies and technical reports.

5.1.1 Hazard Risk Summary

In order to provide a comprehensive assessment of each hazard in each jurisdiction, the hazards were scored based on a number of vulnerability factors including area impacted, health and safety of the population, property, environment, and economic vulnerability. Each of these factors has been assigned a number between one and five, based on risk, with five being the greatest. The values then were summed and multiplied by the probability of occurrence factor, which is also a 1 to 5 scale. The resulting value is a risk rating for each hazard within a specific jurisdiction. **Table 5.1** provides the top three hazard vulnerabilities for each participating jurisdiction within Volusia County. A complete list of hazards for each jurisdiction as well as the score for each hazard and vulnerability factor can be found in **Appendix F**. Further, the Vulnerability Assessment (Section 6) also provides information on hazard vulnerability at the jurisdictional level.

TABLE 5.1: Summary of Hazard Risk Ratings

	Hazard Risk Rating		
	Factor	Score	Total
Deerfield Beach	High Winds	Hail	Storm Surge, Tsunami
Deerfield Beach Senior	All-Natural Hazards	Flooding	Storm Surge, Tsunami
Deerfield	Flooding	High Winds	Lightning
Deland	High Wind	Hail	Severe Winter Storm
DeLand	Lightning	Severe Winter Storm	Drought
Edgewater	Thunderstorm	Severe Winter Storm	Drought
Hempstead	High Winds	All-Natural Hazards	Lightning
Leisure City	High Winds	Flooding	Drought
North St. Johns River	High Winds	Flood	Storm Surge
Orlando	Flooding	Flooding	Wildfire
Orlando City	Lightning	High Winds	Drought
Orlando International	High Winds	Flooding	Storm Surge
Palm Bay	Wildfire	Wind	Drought
Palm Bay Lakes	High Winds	Storm Surge/Tsunami	Flooding

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TABLE 5.19: Snapshot of Hazard Risk Ranking

	Hazard Risk Ranking		
	First	Second	Third
Port Orange	High Winds	Lightning	Severe Winter Storm
South Daytona	Flooding	Storm Surge, Tsunami	All-Natural Hazards
Unincorporated	High Winds	Flooding	Wildfire

5.17.2 Final Determinations

The conclusions drawn from the hazard profiling process for Volusia County resulted in the classification of risk for each identified hazard according to three categories: High, Moderate and Low Risk (**Table 5.20**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Volusia County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in the *Vulnerability Assessment* section.

It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Three risk categories – high risk, moderate risk, and low risk, were developed for each hazard in order to establish a baseline relative risk assessment. The following scoring system was developed in order to score hazards.

Hazard Score = **Frequency of Hazard** x **Community Cost of Hazard**

Point System:

Frequency of Hazard ≥ 10 Times Per Year: 20

Frequency of Hazard ≥ 1 Time Per Year, ≥ 10 Times Per Year: 10

Frequency of Hazard ≥ 1 Time Per Year: 5

Frequency of Hazard ≥ 1 Time Per 10 Years: 1

General Cost Per Occurrence ≥ \$10,000,000: 20

General Cost Per Occurrence \$500,000 - \$10,000,000: 10

General Cost Per Hazard Occurrence \$100,000 - \$500,000: 5

General Cost Per Hazard Occurrence ≤ \$100,000: 2

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Hazard Point Matrix

Hazard	Frequency	Cost Severity	Total Score
Hurricane/Tropical Storm	5	20	100
Wildfire	10	10	100
Storm Surge	5	20	100
Flooding	20	2	60
Lightning	20	2	60
Thunderstorm	20	2	60
Erosion	5	10	50
Tornado	5	10	50
Drought	5	10	50
Sinkhole	10	2	20
Hail	10	2	20
Severe Winter Storm	1	20	20
Tsunami	1	20	20
Sea Level Rise	20A	20A	20A

20A Sea level rise does not fit the same hazard classification standard at this time. Impacts will be more measurable in future years as new water level and losses data is collected and aggregated.

TABLE 5.20: Conclusions on Hazard Risk for Volusia County (Natural Hazards)

HIGH RISK (51 Points or More)	Hurricane and Tropical Storm (High Winds) Flooding Lightning Thunderstorm Wildfire Storm Surge
MODERATE RISK (25 to 50 Points)	Drought Tornado Erosion
LOW RISK (Less than 25 points)	Hail Severe Winter Storm Sinkhole Tsunami

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5.18 DEVELOPMENT SINCE 2015 (LAST LMS SUBMITTAL)

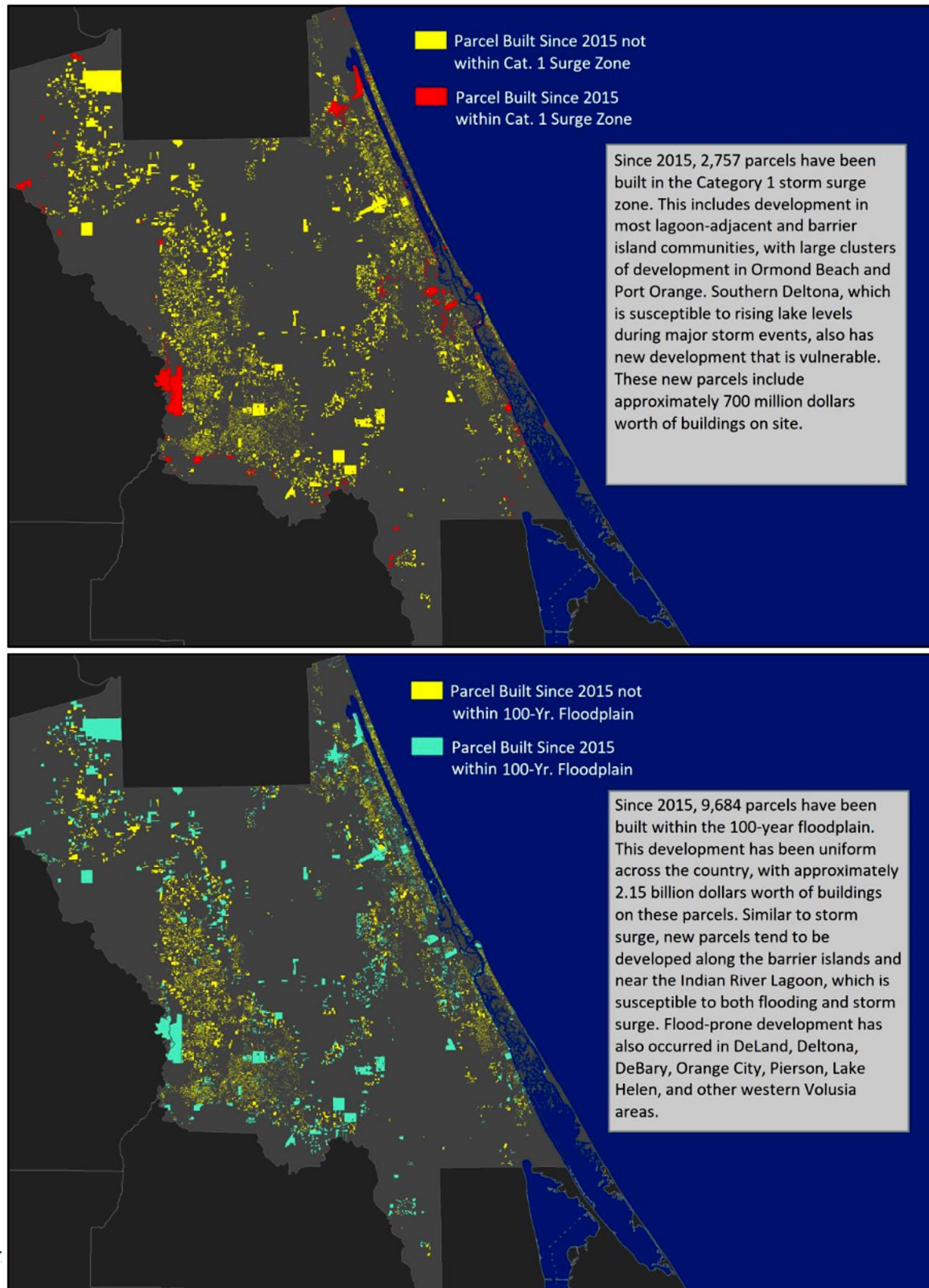
The map on the next page shows development in Volusia County from 2015 to 2017 with exposure to flood zones and the category 1 storm surge zone. Overall, development in the county has been fairly uniform and spread across the County.

The eastern portion of the county is susceptible to more hazards than the western portion, in general. Areas such as Ormond Beach, Daytona Beach, Holly Hill, South Daytona, Ponce Inlet and New Smyrna Beach have experienced growth since 2015, much of it along the barrier islands to the east of the Indian River Lagoon. These areas are susceptible to hurricanes, storm surge, and sea level rise. The western portion of the county has also experienced growth. Deltona, DeBary, DeLand and Orange City are typically more susceptible to sinkholes.

For more information on recent development in the hazard zones covered in this report, view the Vulnerability Assessment in Section 6.

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FIGURE 5.15: Development, 2015-2019



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44 CFR Requirement

44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. The description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

6.1 OVERVIEW

This section builds upon the information provided in Section 5: *Hazard Profiles* by identifying and characterizing an inventory of assets in Volusia County, and then assessing the potential impact and amount of damages that can be expected to be caused by each identified hazard event. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In so doing, Volusia County and its participating jurisdictions and partners may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

This section begins with an explanation of the methodology applied to complete the hazard vulnerability assessment, followed by a summary description of the asset inventory as compiled for Volusia County. The remainder of this section focuses on the results of the vulnerability assessment, and is organized by hazard as listed below.

- ▶ **Atmospheric**
 - Hail
 - Hurricane and Tropical Storm
 - Lightning
 - Severe Winter Storm
 - Thunderstorm
 - Tornado
- ▶ **Hydrologic**
 - Coastal Erosion
 - Drought
 - Flood
 - Storm Surge
 - Sea Level Rise
- ▶ **Geologic**
 - Sinkhole

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- Tsunami
- ▶ **Other**
 - Wildfire
 - Sea Level Rise

6.2 ASSESSMENT METHODOLOGY

This vulnerability assessment was conducted utilizing two distinct methodologies: (1) a Geographic Information System (GIS)-based analysis; and (2) applying a statistical risk assessment approach. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information. The results of the vulnerability assessment are provided for each hazard listed above.

A GIS-based analysis was conducted for seven hazards:

- Hurricane and Tropical Storm
- Riverine Flood
- Coastal Flood (Storm Surge)
- Sea Level Rise
- Coastal Erosion
- Tsunami
- Sinkhole
- Wildfire

A statistical risk assessment approach was used to analyze six hazards:

- Hail
- Thunderstorm
- Lightning
- Tornado
- Severe Winter Storm
- Drought

6.2 GIS-Based Analysis

For the GIS-based assessment, digital data was collected from local, state and national sources. ESRI ArcGIS 10.6 was used to assess risk utilizing digital data including local tax records for individual parcels and georeferenced point locations for critical facilities. Using these data layers, risk was assessed by estimating the assessed building value associated with parcels determined to be located in identified hazard areas. HAZUS-MH was also used to model hurricane force winds and estimate potential losses. To estimate population in hazard areas, Census 2010 population data by census block was obtained from HAZUS-MH and census blocks intersecting with hazard areas were used to determine exposed population counts.

Census 2010 data was used for analyses as it is available by census block. There are other population estimates that are provided by reputable sources; however, they are only available at the jurisdiction

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level (e.g., county or city). Jurisdictional level population estimates cannot be used to accurately conduct GIS analyses to determine how much of the county and its population is exposed to various hazards based on geographic location (i.e., census block or tract level). When the next decennial census population data is available the county will consider reassessing the populations that are vulnerable to various hazards.

The objective of the GIS-based analysis was to determine the estimated vulnerability of people, buildings and critical facilities to the identified hazards for Volusia County using best available geospatial data. In so doing, local databases made available through Volusia County such as local tax assessor records, parcel boundaries and critical facilities data were used in combination with digital hazard data. The results of the analysis provided an estimated number of people, as well as the numbers and values of buildings and critical facilities determined to be potentially at risk to those hazards with delineable geographic hazard boundaries. These hazards included flood, storm surge, dam failure, wildfire and technological hazards. A more specific description of the GIS-based analysis for each particular hazard is provided under the vulnerability assessment section of each respective hazard.

HAZUS-MH

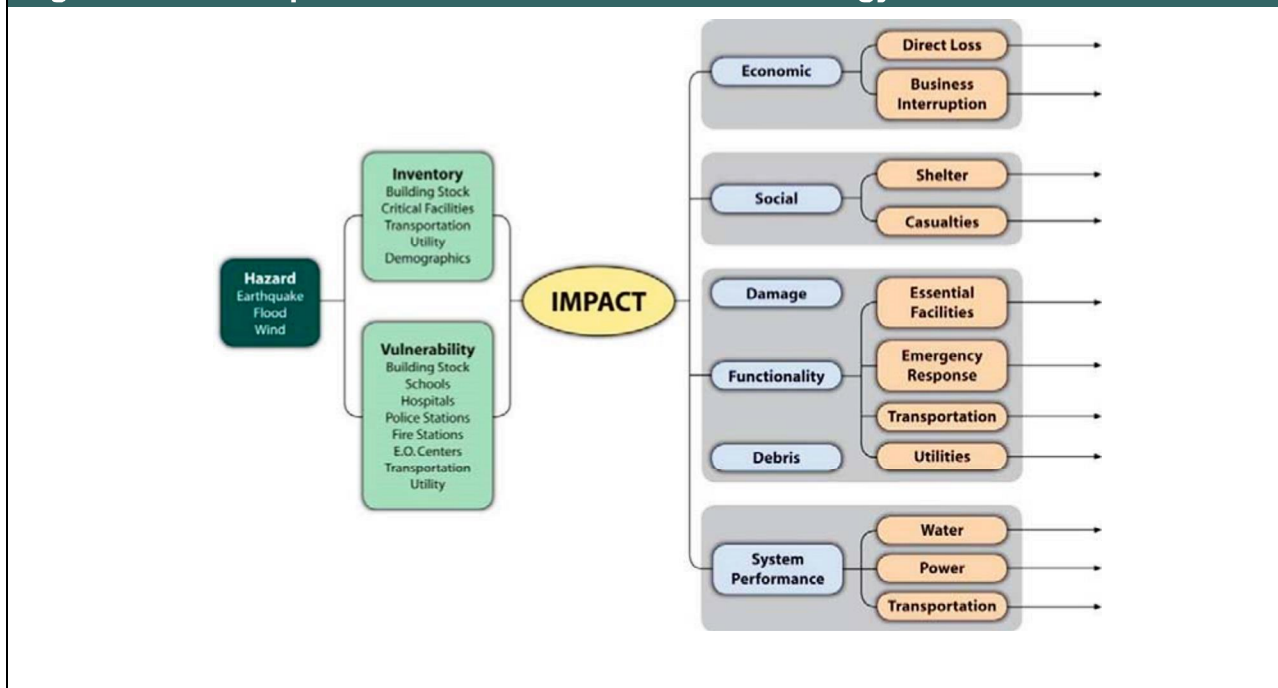
HAZUS-MH is FEMA's standardized loss estimation software program built upon an integrated GIS platform (**Figure 6.1**) to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The HAZUS-MH risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) were modeled using the HAZUS-MH software to determine the impact (i.e., damages and losses) on the built environment. This risk assessment applied HAZUS-MH to produce countywide profiles and estimate losses for three hazards at the jurisdictional level. At the time this analysis was completed, HAZUS-MH



MR-3 was used to estimate potential losses from hurricane winds, coastal flood, and earthquake using HAZUS-MH default building stock inventory data. The results of the HAZUS-MH model analysis include annualized loss estimates for each participating jurisdiction in Volusia County so that potential loss values may be compared to one another throughout Volusia County. In generating loss estimates through HAZUS-MH, some data normalization was necessary to account for recognized differences between actual assessed building values as provided by Volusia County and estimated replacement building value data as provided within HAZUS-MH. In order to account for the difference between modeled and actual values, the ratio of estimated losses produced by HAZUS-MH as compared to total HAZUS-MH building inventory was used to estimate percent damage. The percent damage ratio was then applied to the local assessed values of each jurisdiction to estimate potential losses and loss ratios in Volusia County for this analysis. The 2019 parcel values were used to generate annualized losses.

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Figure 6.1: Conceptual Model of HAZUS-MH Methodology



6.3 Statistical Risk Assessment Methodology

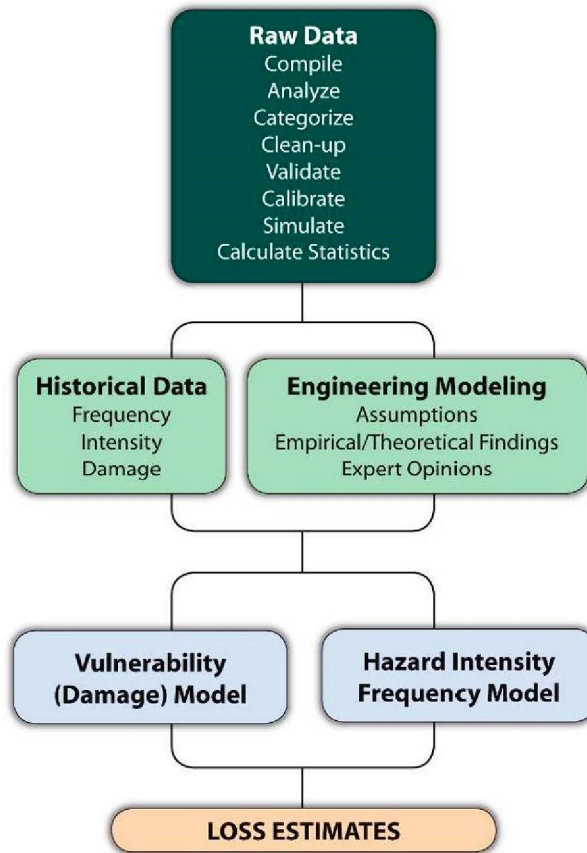
The statistical risk assessment approach was applied to analyze hazards of concern that were outside the scope of HAZUS-MH and the GIS-based risk assessment. This methodology uses a statistical approach and mathematical modeling of risk to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historic damage information. This methodology was used to assess risk to the extreme temperatures, hail, tornado, winter storm and drought hazards. Available historical data for each hazard was used and statistical evaluations were performed. The general steps used in the statistical risk assessment methodology are summarized below:

1. Compile data from local, state and national sources, as well as literature
2. Clean up data, including removal of duplicate records and update losses to account for inflation
3. Identify patterns in frequency, intensity, vulnerability and loss
4. Statistically and probabilistically extrapolate the patterns and
5. Produce meaningful results, including the development of annualized loss estimates.

Figure 6.2 illustrates a conceptual model of the statistical risk assessment methodology as applied to the Volusia County area.

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Figure 6.2: Conceptual Model of the Statistical Risk Assessment Methodology



The vulnerability assessment findings are presented in terms of potential annualized losses, wherever possible. In general, presenting results in the annualized form is useful in three ways:

1. This approach accounts for the contribution of potential losses from all future disasters;
2. Annualized results for different hazards are readily comparable, thus easier to rank; and
3. The use of annualized losses is the most objective approach for evaluating mitigation alternatives.

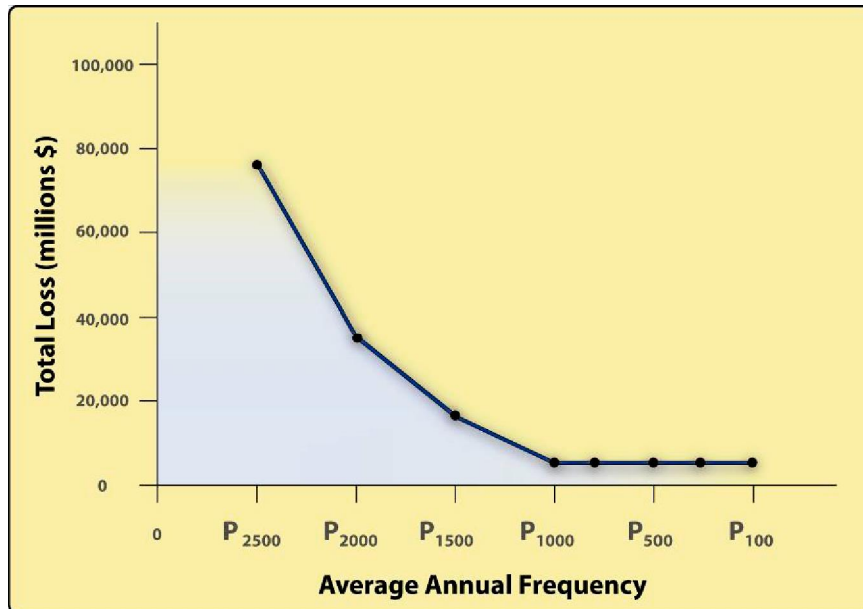
Annualized losses for the hazards where the parametric approach was utilized were computed in a three-step process:

1. Compute/estimate losses for a number of scenario events with different return periods [e.g., 10-year, 100-year, 200-year, 500-year, etc.];
2. Approximate the Probability versus Loss Curve through curve fitting; and
3. Calculate the area under the fitted curve to obtain annualized losses.

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This approach is illustrated graphically in **Figure 6.3**. For other hazards where the statistical approach was used, the computations are based primarily on the observed historical losses.

Figure 6.3: Graphical Representation of the Annualized Loss Methodology



The economic loss results are presented here using two interrelated risk indicators: Annualized Loss and Annualized Loss Ratio. The Annualized Loss is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., municipal jurisdiction). The Annualized Loss Ratio expresses estimated annualized loss normalized by assessed building value.

The estimated Annualized Loss (AL) addresses the key idea of risk: the probability of the loss occurring in the study area (largely a function of building construction type and quality). By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the risk. The Annualized Loss Ratio (ALR) represents the AL as a fraction of the assessed value of the local inventory. This ratio is calculated using the following formula:

$$\text{ALR} = \text{Annualized Losses} / \text{Total Exposure}$$

The ALR gauges the relationship between average annualized loss and assessed values. This ratio can be used as a measure of vulnerability in the areas and since it is normalized by assessed value, it can be directly compared across different geographic units such as metropolitan areas, counties or municipalities.

Loss estimates provided in this vulnerability assessment are based on best available data, and the methodologies applied result in an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation

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methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics or economic parameters).

Findings for each hazard are detailed in the hazard-by-hazard vulnerability assessment that follows.

6.1 ASSET INVENTORY

An inventory of Volusia County's georeferenced assets was created in order to identify and characterize those properties potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Three categories of assets were created and assessed through GIS analysis, including:

1. **Improved Property:** Includes all improved properties in unincorporated areas according to local parcel data provided by Volusia County. The information has been expressed in terms of the number of parcels, number of buildings, and total assessed value of improvements (buildings and accessory structures) that may be exposed to the identified hazards.
2. **Critical Facilities:** Includes Volusia County's emergency operations centers, fire stations, police stations, schools and hospitals.
3. **Critical Infrastructure:** Includes primary roads and active railroads.

Improved Property

Table 6.1 lists the number of parcels with improved property (i.e., structures) and the total assessed value of improvements¹ for unincorporated Volusia County and the incorporated areas (study area of vulnerability assessment). The study area is depicted in **Figure 6.1**. The population by census block has been illustrated in lieu of the parcels, which would not be meaningful at the countywide scale map. The population by census block is illustrated to show where populations are concentrated in the study region. According to the U.S. Census American Community Survey (2012-14) there were 2.36 people per household. There were 2.32 people per household according to the 2010 U.S. Census.

¹ Total assessed values for improvements is based on 2019 Volusia County tax assessor records (noted in table as 'Building Value')

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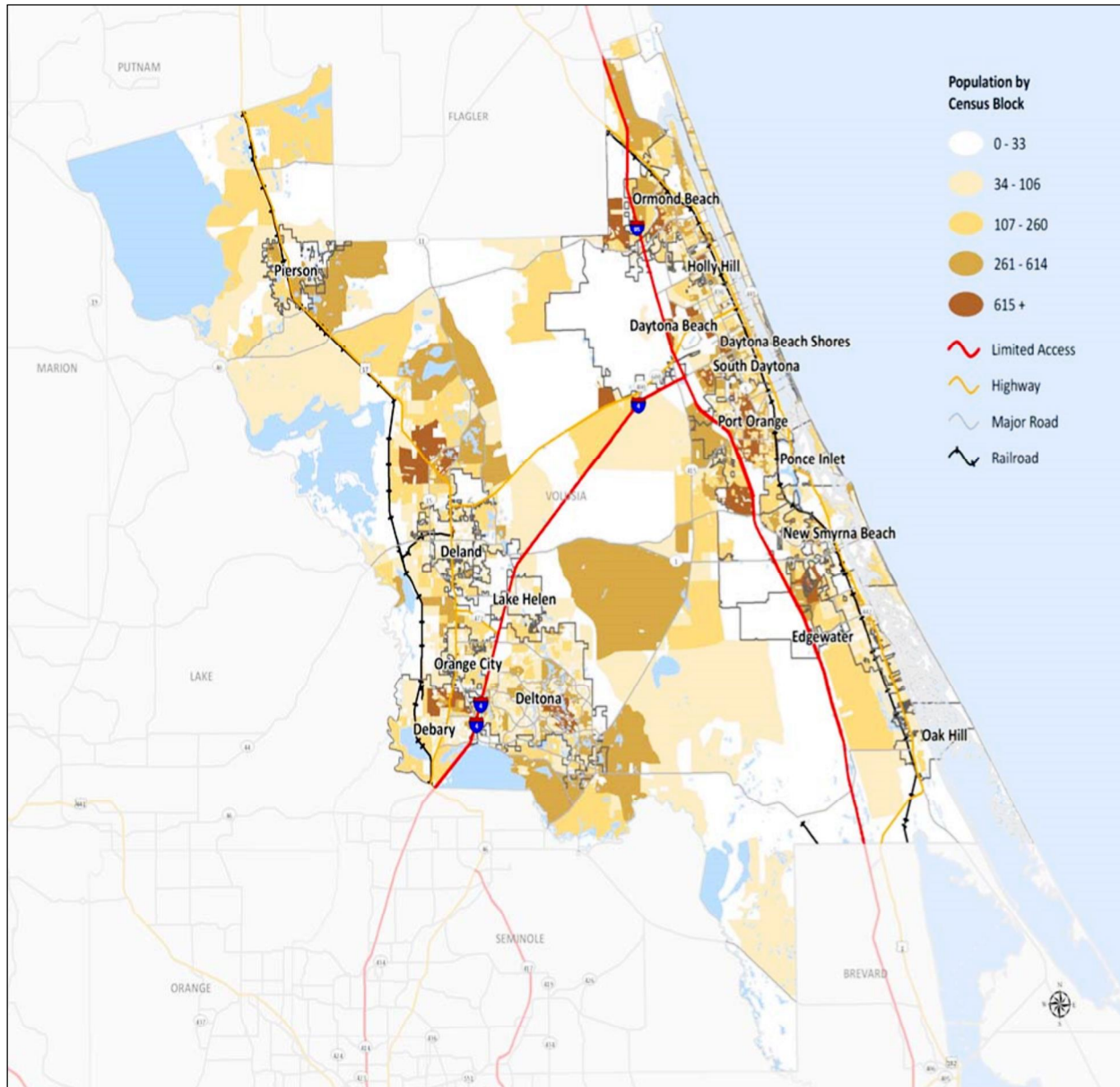
TABLE 6.1: Volusia County Improved Property

JURISDICTION	TOTAL ESTIMATED NUMBER OF IMPROVED PARCELS/CONDOS	TOTAL IMPROVED VALUE OF IMPROVED PARCELS/CONDOS
Daytona Beach	20,804	5,036,150,652
Daytona B. Shores	670	235,084,140
DeBary	8,835	1,458,448,319
De Land	11,557	2,429,373,658
Deltona	33,997	4,758,973,858
Edgewater	9,899	1,342,087,145
Holly Hill	4,665	565,510,613
Lake Helen	1,151	140,464,924
New Smyrna Beach	13,775	2,761,841,839
Oak Hill	1,105	117,259,007
Orange City	3,210	784,734,035
Ormond Beach	17,146	3,485,721,297
Pierson	665	79,895,417
Ponce Inlet	1,248	321,498,032
Port Orange	22,101	4,016,512,204
South Daytona	4,810	630,136,924
Unincorporated	73,959	11,005,217,616
TOTAL	187,054	39,168,909,680

Source: Volusia County Property Appraiser Data (2019)

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FIGURE 6.4: Volusia County LMS Study Region with Population by Census Block



Source: 2010 U.S. Census

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Critical Facilities

Table 6.2 lists Volusia County's critical facilities, as identified by each jurisdiction in Volusia County.

A full listing of the critical facilities and their exposure to each hazard included in this vulnerability assessment is located in **Appendix E**. This information is not available for public distribution as it contains sensitive information. The critical facilities data is on file with Volusia County Emergency Management.

Please note that the numbers within this critical facility listing do not include lift stations, wastewater facilities or sewage treatment facilities. Information on those facilities can be found within Appendix E and the Volusia County Floodplain Management Plan, within Appendix I, by jurisdiction.

TABLE 6.2: Volusia County "Core" Critical Facilities	
JURISDICTION	Number
Daytona Beach	65
Daytona Beach Shores	8
DeBary	6
DeLand	44
Deltona	17
Edgewater	12
Holly Hill	11
Lake Helen	5
New Smyrna Beach	25
Oak Hill	7
Orange City	18
Ormond Beach	56
Pierson	8
Ponce Inlet	7
Port Orange	52
South Daytona	14
Unincorporated	8
TOTAL	363

Source: All Jurisdictions (Cities, County)

Note: These numbers do not reflect certain types of critical facilities that are additionally listed in the Critical Facility Appendix within this report. Please reference that listing for more information. These numbers only reflect the number of "core" facilities, not including water and sewage treatment plants or state flood facilities.

Specifically, this table identifies 922 out of a total of 1125 total critical facilities identified.

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Infrastructure and Lifelines

Table 6.3 lists Volusia County's primary roads and railroads.

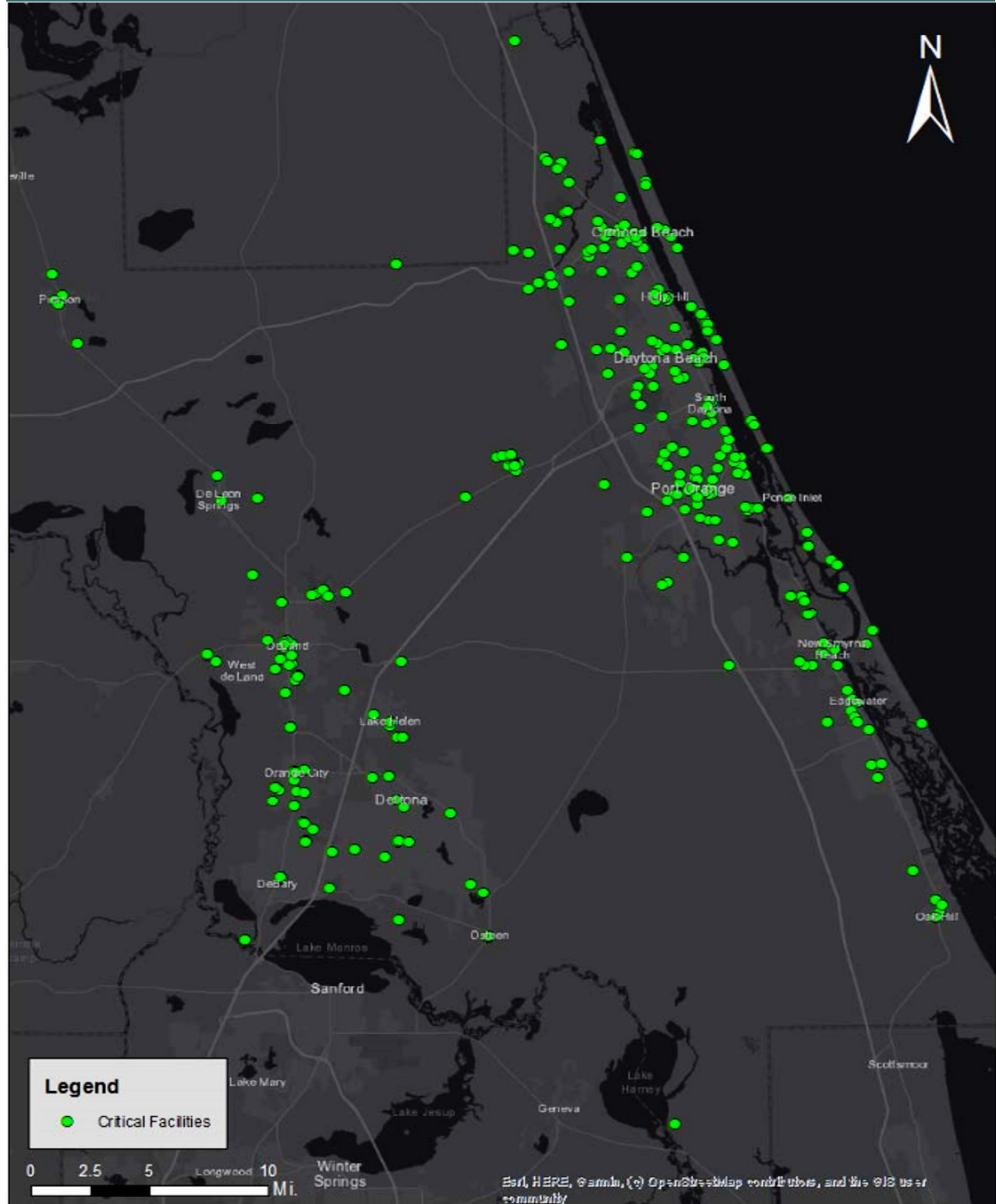
TABLE 6.3: Infrastructure			
JURISDICTION	Limited Access (mi)*	Highway (mi)*	Railroad (mi)**
Daytona Beach	5.02	8.66	2.56
Daytona Beach Shores	-	-	-
DeBary	0.22	5.25	6.87
DeLand	-	7.64	1.18
Deltona	6.28	0.02	-
Edgewater	2.20	7.22	5.41
Holly Hill	-	2.72	2.56
Lake Helen	1.10	-	-
New Smyrna Beach	-	6.20	6.62
Oak Hill	-	2.88	1.22
Orange City	-	4.27	-
Ormond Beach	2.41	5.02	7.82
Pierson	-	2.21	4.02
Ponce Inlet	-	0.27	-
Port Orange	10.61	2.40	4.24
South Daytona	-	2.51	2.26
Unincorporated	62.52	50.84	51.05
TOTAL	91.36	110.42	98.48

Source: Volusia County GIS Department

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Figure 6.2 illustrates the general locations of the critical facilities and infrastructure according to currently georeferenced point and line locations. Facilities were provided by each jurisdiction.

FIGURE 6.2: Volusia County Critical Facilities



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6.4 HAIL

As it cannot be predicted where hail may fall, all existing and future buildings, facilities and populations in Volusia County are considered to be equally exposed to this hazard and could potentially be impacted. When hail impacts Volusia County and all municipalities, populations are vulnerable to the consequences of damage from hail. Hail can become as big as baseballs or golf balls, damaging structures such as car windows, emergency vehicles, exposed persons and communication systems, but is typically the size of pennies or quarters in Florida. Hail storms can last for a few minutes to hours. It is important to note that only reported hail events have been factored into this vulnerability assessment². If hail strikes a human being it can cause personal injury.

To estimate losses due to hail, the National Climatic Data Center (NCDC) historical hail event loss data for occurrences in the county were used to develop a hail stochastic model. In this model:

- Losses were scaled for inflation;
- Average historic hail damageability was used to generate losses for historical hail events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data; and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.4 shows total exposure and potential annualized property losses and annualized percent loss ratios resulting from hail for Volusia County. While all of Volusia County's inventoried assets are equally exposed to hail, any anticipated future damages or losses are expected to be minimal. The graph below describes the common reference names to different sizes of hail. Florida typically experiences pea to half-dollar sized hail.

FIGURE 6.6: Hail Typology

Appearance	Approximate Size in Inches
Pea	0.25 - 0.50 inch
Penny	0.75 inch
Nickel	0.88 inch
Quarter	1.00 inch
Half Dollar	1.25 inch
Walnut/Ping Pong	1.50 inch
Golf ball	1.75 inch
Hen Egg	2.00 inch
Tennis Ball	2.50 inch
Baseball	2.75 inch
Tea Cup	3.00 inch
Grapefruit	4.00 inch
Softball	4.50 inch

²Source: National Climatic Data Center (2014)

It is possible that additional hail events may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

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TABLE 6.4: Total Exposure and Potential Annualized Losses from Hail

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	3,439	0.000%
Daytona B. Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	0	0.000%
DeLand	2,429,373,658	0	0.000%
Deltona	4,758,973,858	0	0.000%
Edgewater	1,342,087,145	1,812	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	0	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	0	0.000%
Pierson	79,895,417	0	0.000%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	109	0.000%
South Daytona	630,136,924	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$5,360	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

Additional Impacts of Hail on Structures and Property

While hail can have effects on populations and can cause injury, hail also has the ability to damage structures. Vulnerable areas of structures include pool screens, windows, and exposed pieces of personal property that are exposed to environmental conditions, such as outdoor décor or automobiles. The size of hail has a direct impact on the scope of the damage that it can incur on a structure. For example, golf ball sized hail (as depicted in Figure 6.6) can completely destroy exposed glass structures, while pea-to-penny-sized hail would have a far lower ability to incur such damage.

There are no specific areas of the county that are at a higher risk to property damage as a result of hail from a geographic perspective. In situations where tornadoes are present, hail may have a higher likelihood of being present. Moreover, structures that have partial or full tree coverage could have lessened property damage due to hail as a result of the slowing speed of the hail before impact with personal property.

SECTION 6: VULNERABILITY ASSESSMENT

6.5 HURRICANE AND TROPICAL STORM

Since hurricanes and tropical storms often impact large areas and cross jurisdictional boundaries, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. All populations may be impacted by these events, but those at the highest risk include the homeless, disabled, elderly and lower income populations. Any persons living on the barrier islands or adjacent to the Intracoastal Waterway system may also be disproportionately impacted. Critical infrastructure such as communication systems and power sources are vulnerable to this event. Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, coastal erosion, high winds and precipitation, thus it is difficult to estimate total potential losses from these cumulative effects.

The current HAZUS-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes. Therefore, only hurricane winds are analyzed in this section. Vulnerability to storm surge resulting from hurricanes is addressed individually in a separate section. A probabilistic scenario was created using HAZUS-MH to assess the vulnerability of Volusia County to hurricane winds. Default HAZUS-MH wind speed data and damage functions were used to determine the annual expected loss at the census tract level. **Table 6.5** shows estimated exposure, potential annualized losses for residential and commercial buildings and the annualized percent loss ratio for each jurisdiction in Volusia County. **Table 6.6** corresponds with **Figure 6.6** and depicts 2019 parcel exposure to wind hazard zones.

TABLE 6.5: Total Exposure and Potential Annualized Losses from Hurricane Wind and Tropical Storm

JURISDICTION	Exposure (Total Improved Value of Parcels/Condos)	Residential Building Losses	Commercial Building Losses	Total Annualized Expected Property Losses	Annualized Percent Loss Ratio
Daytona Beach	5,036,150,652	7,213,372	1,318,515	14,134,287	0.33%
Daytona B. Shores	235,084,140	2,179,703	121,975	3,439,875	2.06%
DeBary	1,458,448,319	946,872	82,215	1,509,843	0.12%
DeLand	2,429,373,658	2,103,874	501,695	4,478,977	0.23%
Deltona	4,758,973,858	5,277,335	395,264	8,392,400	0.22%
Edgewater	1,342,087,145	1,817,815	198,429	3,115,697	0.28%
Holly Hill	565,510,613	1,023,774	222,873	2,225,637	0.42%
Lake Helen	140,464,924	219,437	21,569	382,395	0.31%
New Smyrna Beach	2,761,841,839	5774,210	776,789	10,671,867	0.50%
Oak Hill	117,259,007	212,684	25,306	392,471	0.41%
Orange City	784,734,035	899,198	211,544	1,750,025	0.27%
Ormond Beach	3,485,721,297	4,326,416	728,606	8,136,035	0.27%
Pierson	79,895,417	207,197	24,144	364,745	0.46%
Ponce Inlet	321,498,032	1,204,140	87,813	1,926,558	0.60%
Port Orange	4,016,512,204	5,942,167	674,178	10,225,446	0.25%
South Daytona	630,136,924	1,354,248	276,673	2,601,905	0.41%
Unincorporated	11,005,217,616	11,820,330	1,106,914	19,789,660	0.18%
Total	\$39,168,909,680	\$52,522,781	\$6,774,501	\$93,537,825	N/A

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.6: 2019 Parcel Exposure to Wind Hazard Zones

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
91-95 mph	44	9	\$4,344,859	\$364,934	\$4,709,793	\$606,995
96-100 mph	136,643	99,756	\$5,169,670,365	\$17,217,266,048	\$22,285,171,648	\$13,974,104,626
101-105 mph	151,347	102,260	\$8,775,404,243	\$21,951,278,698	\$27,140,699,701	\$18,386,669,381

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
91-95 mph	9	1	0	1	3	4
96-100 mph	99,756	7,113	7,008	15,981	16,470	53,184
101-105 mph	102,260	18,338	9,902	19,250	12,224	42,546

Land Use Summary of Parcels within Hazard Zones – Number of Parcels per Land Use and Hazard Zone						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
91-95 mph	0	0	0	1	13	30
96-100 mph	94,104	3,053	1,013	1,286	4,053	33,134
101-105 mph	94,638	4,891	1,564	1,967	3,857	44,430

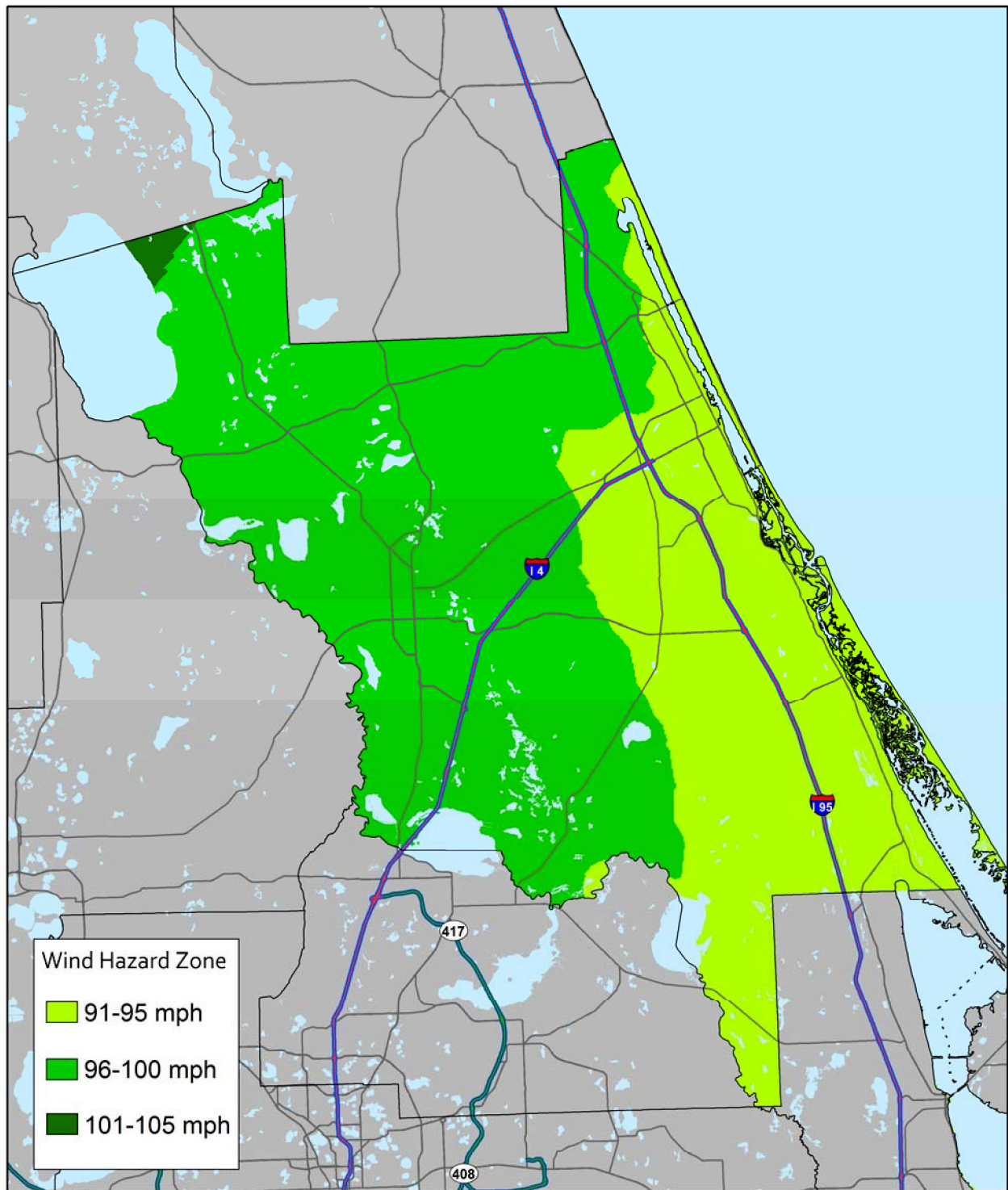
Sources: HAZUS-MH, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO

Qualitative Assessment of Wind Hazard Zone Vulnerability

Table 6.6 (above) and Figure 7 on the following page depict the likely wind speeds that would be experienced within Volusia County during a hurricane situation. The model utilized takes the average tropical storm that is likely to hit Florida based off of historical data, which places Volusia County in a lower risk zone as compared to areas of the state such as the western panhandle and southeastern Florida. As depicted in the map on the following page, areas of the county that are at highest risk for wind damage are those within close proximity to the Atlantic Ocean or areas closest to the southeastern portion of the county. 151,347 parcels within the county are located within the 101-105 mile per hour hazard zone, representing the largest portion of parcels, while 136,643 parcels in the county are located within the 96-100 mile per hour zone. The build year of these parcels are fairly evenly distributed. However, 21.9% of the parcels within the 101-105 mile per hour zone were built before 1970, which could indicate that these buildings are at a higher risk for property damage. Please reference Appendix E for an entire listing of critical facilities and their corresponding wind hazard zones.

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FIGURE 6.7: Wind Hazard Zones



Source: HAZUS-MH

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6.6 LIGHTNING

As it cannot be predicted where lightning may strike, all existing and future buildings, facilities and populations in Volusia County are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported lightning strikes have been factored into this vulnerability assessment³.

To estimate losses due to lightning, NCDC historical lightning loss data for occurrences in the County were used to develop a lightning stochastic model. In this model:

- Losses were scaled for inflation;
- Average historic lightning damageability was used to generate losses for historical lightning events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data; and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.7 shows total exposure and potential annualized property losses and percent loss ratios resulting from the lightning hazard for Volusia County. Based on local knowledge, emergency managers in Volusia County are aware that approximately 4,000 lightning strikes occur each week during summer afternoon thunderstorms. Although the annualized losses from lightning in Volusia County are low, the probability and frequency are high. Therefore, it is anticipated that lightning will continue to threaten life and pose property damage throughout the county.

Lightning is a dangerous threat to people in the United States, particularly those who are outside during the summer. The number one area for fatalities due to lightning strikes is open fields, making Volusia County's 47 miles of Atlantic Ocean beach among the most dangerous in the County. This heightens the risk for the tourist population who may be unaware of the imminent danger of quickly approaching tropical systems that emit lightning. This was true in July 2014 during the Coke Zero 400, when hundreds of thousands of tourists were outside and exposed with no coverage for lightning. Communication systems and power sources are among the most vulnerable land uses to this hazard due to their electrical nature. Volusia County has 30 golf courses, along with private and public recreational facilities, the Daytona Beach International Speedway and 2 additional smaller outdoor race tracks, 2 intracoastal waterways traversing the county, school facilities, and parks located throughout the County. Individuals participating in the following recreational activities could be vulnerable to lightning including: golf, football, baseball, soccer, surfing, horseback riding, walking, jogging, tennis, boating, fishing, kite flying, kayaking, paddle boarding, beach activities, picnicking, camping, hiking, gardening, hunting, swimming, basketball, softball, cycling, wind surfing, lacrosse, archery, track and field events, stock car races, outdoor festivals and numerous other outdoor activities. It is estimated that at least 75% of the population participates in at least one of these recreational activities, and is thus vulnerable to lightning.

³ It is possible that additional lightning strikes may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

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TABLE 6.7: Total Exposure and Potential Annualized Losses from Lightning

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	567	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,312	6,834	0.000%
DeLand	2,422,373,658	0	0.000%
Deltona	4,758,273,858	7,826	0.000%
Edgewater	1,342,087,145	430	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,224	0	0.000%
New Smyrna Beach	2,761,841,832	2,568	0.000%
Oak Hill	117,252,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,227	0	0.000%
Pierson	72,825,417	0	0.000%
Ponce Inlet	321,428,032	0	0.000%
Port Orange	4,016,512,204	8,022	0.000%
South Daytona	630,136,224	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$26,316	0.000%

Sources: National Climatic Data Center, AZUS-M, Volusia County Property Appraiser Data 2012

Qualitative Assessment of Lightning Vulnerability

Like hail, lightning does not affect certain geographical areas of the county at higher rates than others. However, certain types of structures, including those with large antennas or those that are taller than the buildings surrounding them, are typically at a higher risk for lightning strikes. In particular, communication facilities may be at a higher risk of a lightning strike, while school assets such as football stadiums with lighting could also be at an increased level of vulnerability.

Secondly, structures that are isolated in areas of low tree coverage are at a higher risk for lightning strikes. Jurisdictions within the county where this could be more common include DeLand 2,422,373,658 worth of improved property value, Lake Helen 140,464,224, Orange City 784,734,035 and Pierson 72,825,417. These areas are generally more rural in nature and have a higher rate of isolated critical facilities and structures.

Beachside structures located near or along the Atlantic Ocean are also at a higher vulnerability to lightning damage. Many utilities are located in these locations. However, most of the buildings located along the beach are hotels, businesses and high-rise condos. There are not many critical facilities located along the Atlantic Ocean in Volusia County, as the majority of those facilities are located inland along the barrier islands or are located west of the Intracoastal Waterway.

SECTION 6: VULNERABILITY ASSESSMENT

6.7 SEVERE WINTER STORM

Severe winter storms, typically consisting of snow and ice, infrequently occur in Volusia County. Since it cannot be predicted where severe winter storms (as defined in the *Hazard Profiles* section) may occur, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported severe winter storm occurrences have been factored into this vulnerability assessment⁴. Winter storms can last days or weeks, depending on the storm and regional climate norms (El Nino year, etc.). Winter storms in Florida typically last less than one week. To estimate losses due to extreme wind, NCDC historical thunderstorm wind loss data for occurrences in the County were used to develop an extreme wind stochastic model. In this model:

- Losses were obtained and scaled for inflation; Average historic extreme wind damageability was used to generate losses for historical thunderstorm wind events where losses were not reported; Expected annualized losses were calculated through a non-linear regression of historical data; and; Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.8 shows total exposure and potential annualized property losses and percent loss ratios resulting from severe winter storm for Volusia County. While all of Volusia County's inventoried assets are equally exposed to severe winter storm, any anticipated future damages or losses are expected to be minimal. The table below depicts wind chill categories often associated with severe winter storms.

FIGURE 6.9: Wind-Chill Advisory Table

Temperature		Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
Wind	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63		
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72		
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77		
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81		
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84		
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87		
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89		
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91		
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93		
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95		
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97		
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98		
Frostbite Times		30 Mins						10 Mins						5 Mins							
Wind chill is calculated by: $Windchill (^{\circ}F) = 35.74 - 0.6215T - 35.75(V^{0.16}) - 0.4275T(V^{0.16})$ Where: T = Air Temperature (F), V = Wind Speed (mph), ^ = raised to a power (exponential)																					

Source: National Weather Service

⁴ It is possible that additional extreme wind events may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.8: Total Exposure/ Potential Annualized Losses from Severe Winter Storm

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	0	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,317	0	0.000%
DeLand	2,427,373,658	0	0.000%
Deltona	4,758,773,858	0	0.000%
Edgewater	1,342,087,145	0	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,224	0	0.000%
New Smyrna Beach	2,761,841,837	0	0.000%
Oak Hill	117,257,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,277	0	0.000%
Pierson	77,875,417	0	0.000%
Ponce Inlet	321,478,032	0	0.000%
Port Orange	4,016,512,204	0	0.000%
South Daytona	630,136,224	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$0	0.000%

Sources: National Climatic Data Center, AZUS-M, Volusia County Property Appraiser Data 2017

Location-Specific Risk

Severe winter storms typically affect entire regions of continents, therefore in the event of a severe winter storm, most of the region would be affected uniformly. However, areas close to the Atlantic Ocean and large regional water bodies could be impacted with a greater magnitude in the event of lake effect wind, sleet or snow conditions. Moreover, areas heavy with agriculture could be at a greater risk from an economic perspective, as these land uses can incur heavy losses when a winter storm strikes. While extremely rare, these types of events have occurred and documented within Volusia County. Winter storms tend to affect transportation infrastructure such as bridges and boat traffic in addition to power sources. Moreover, the Town of Pierson is the Winter Capital of the World and could incur a large financial loss in the event of a severe winter storm. All populations of Volusia County are vulnerable to severe winter storms despite the rarity of such events. However, the elderly, low income and homeless populations are at a disproportionately higher level of vulnerability to these events.

As stated above, agricultural areas are the most vulnerable areas to severe winter storms. However, damage to critical facilities, businesses and homes can occur as a result of these events. While annualized losses for these events are very hard to measure due to the low probability of these storms, pipe freezes, as well as roof deterioration can occur.

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6.8 THUNDERSTORMS

Thunderstorms frequently occur in Volusia County. Since it cannot be predicted where thunderstorms may occur, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported thunderstorm occurrences have been factored into this vulnerability assessment⁵. To estimate losses due to extreme wind, NCDRC historical thunderstorm wind loss data for occurrences in the county were used to develop an extreme wind stochastic model. In this model:

- Losses were obtained and scaled for inflation; Average historic extreme wind damageability was used to generate losses for historical thunderstorm wind events where losses were not reported; Expected annualized losses were calculated through a non-linear regression of historical data; and; Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.9 shows total exposure and potential annualized property losses and percent loss ratios resulting from thunderstorms for Volusia County. Although, the annualized losses from thunderstorms in Volusia County are low, the probability and frequency are high. Therefore, it is anticipated that thunderstorms will continue to threaten life and pose property damage throughout the county.

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED % LOSS RATIO
Daytona Beach	5,036,150,652	3,645	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	290	0.000%
DeLand	2,429,373,658	11,615	0.001%
Deltona	4,758,973,858	5,098	0.000%
Edgewater	1,342,087,145	17,886	0.002%
Holly Hill	565,510,613	530	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	1,137	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	933	0.000%
Ormond Beach	3,485,721,297	1,857	0.000%
Pierson	79,895,417	528	0.001%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	1,651	0.000%
South Daytona	630,136,924	1,089	0.000%
Unincorporated	11,005,217,616	48,397	0.000%
TOTAL	\$39,168,909,680	\$94,656	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Thunderstorm Vulnerability

Severe weather events such as thunderstorms can impact all areas of Volusia County, depending on the location of the thunderstorm, its direction, and its lateral speed across the Earth's lower atmosphere. These events can cause damage to structures, disruption of utilities and surface/air transportation.

While all populations can be impacted by thunderstorms, lack of shelter puts the homeless at highest risk. Spectator's at large outdoor special events and/or recreational areas are highly susceptible to the effects of thunderstorms.

Further details are provided in the profiles for lightning, flooding, hail, wind, winter storms, tornadoes and storm surge all of which highlight the many risks that come about from thunderstorms.

SECTION 6: VULNERABILITY ASSESSMENT

6.9 TORNADO

Historical evidence shows that Volusia County is vulnerable to tornadic activity. This hazard can result from severe thunderstorm activity or may occur during a major tropical storm or hurricane. Since it cannot be predicted where a tornado may touch down, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only reported tornadoes have been factored into this vulnerability assessment⁶.

While all populations in Volusia County can be impacted, the most vulnerable are homeless, the elderly and those of lower income. Communities such as mobile home parks and manufactured housing parks are the most susceptible to the effects of tornadoes. Volusia County has depending on location severity, tornadoes can cause social disruption in the form of electrical outages, transportation problems and economic loss. All populations and infrastructure are vulnerable to tornadoes due to the high winds and debris field.

To estimate losses due to tornadoes, NCEC historical tornado loss data for occurrences in the County were used to develop a tornado stochastic model. In this model:

- Losses were scaled for inflation
- Average historic tornado damageability was used to generate losses for historical tornadic events where losses were not reported
- Expected annualized losses were calculated through a non-linear regression of historical data and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Volusia County has mobile home/manufactured home parks throughout the county, both east and west sides which are equally vulnerable to impacts of tornadoes. Many of the parks are new and older only while others have very old mobile homes that are not built to today's building standards leaving the elderly and low-income populations more at risk.

Table 6.10 shows total exposure and potential annualized property losses and percent loss ratios resulting from the tornado hazard for Volusia County. Although, the annualized losses from tornadoes vary in Volusia County, the probability and frequency are high for tornadic activity is high throughout the County. Therefore, it is anticipated that tornadoes will continue to threaten life and pose property damage throughout the County. **Table 6.11** corresponds with **Figure 6.7** and depicts 2020 parcel exposure to differing proximities of tornadoes from 2020 through 2022.

⁶ It is possible that additional tornado events may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

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TABLE 6-2: Total Exposure and Potential Annualized Losses from Tornado

JURISDICTION	EXPOSURE TOTAL IMPROVED VALUE OF PARCELS CONSIDERED	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	\$1,036,220,622	\$1,222,202	0.0002
Daytona Beach Shores	232,022,220	223	0.0002
Deary	\$1,222,222,322	20,622	0.0022
DeLand	2,222,323,622	222,023	0.0002
Deltona	\$1,222,223,222	222	0.0002
Edgewater	\$1,322,022,222	20,022	0.0022
Holly Hill	262,220,623	0	0.0002
Lake Helen	220,262,222	0	0.0002
New Smyrna Beach	2,262,222,232	620,360	0.0322
Oak Hill	222,222,002	22,222	0.0222
Orange City	222,232,032	0	0.0002
Ormond Beach	3,222,222,222	262,220	0.0022
Pierson	22,222,222	2,262	0.0032
Ponce Inlet	322,222,032	326	0.0002
Port Orange	\$1,026,222,202	32,220	0.0022
South Daytona	630,236,222	322	0.0002
Unincorporated	22,002,222,626	2,332,222	0.0222
TOTAL	22222622222222	2222222222	0.0222

Sources: National Climatic Data Center, 2022 S-M2, Volusia County Property Appraiser Data 20222

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TABLE 6.11: 2019 Parcel Exposure to Tornado Proximity (Tornado Tracks 1950-2019)

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
Within 0.25 Miles	37,188	27,130	\$2,044,686,478	\$5,727,125,790	\$7,383,095,402	\$4,241,311,092
Between 0.25 and 0.50 Mi.	36,103	26,008	\$1,657,069,001	\$4,686,605,017	\$5,801,733,467	\$3,896,336,101

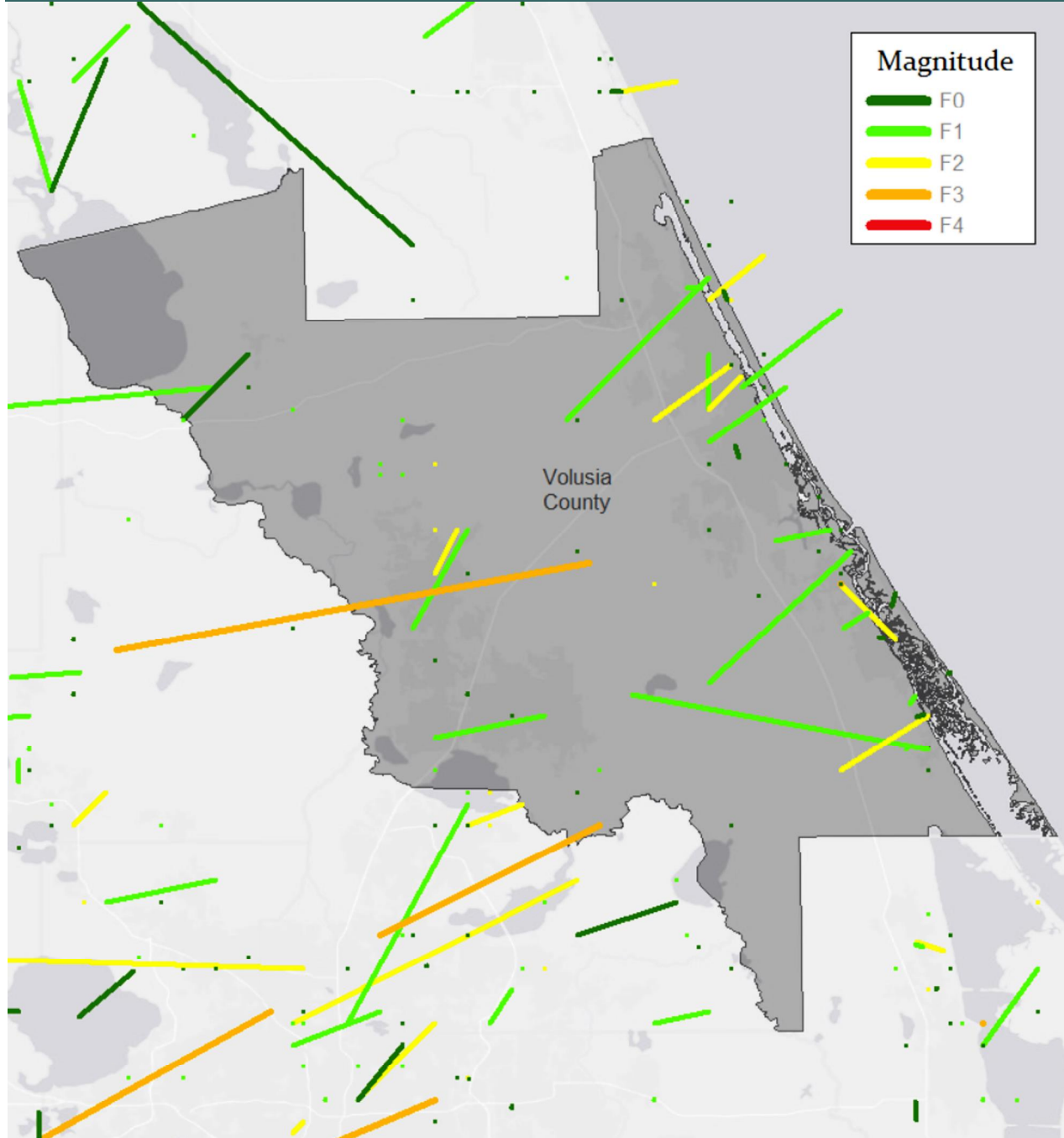
Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
Within 0.25 Miles	27,130	5,911	2,904	4,889	2,570	10,856
Between 0.25 and 0.50 Mi.	26,008	5,314	2,297	5,069	2,701	10,627

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
Within 0.25 Miles	23,836	2,065	356	880	605	9,446
Between 0.25 and 0.50 Mi.	23,351	1,635	363	746	577	9,431

Sources: National Weather Service, Volusia County Property Appraiser Data 2020. Some parcels were not provided a land use code by VC.

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FIGURE 6.10: Historic Tornado Tracks (1950-2019)



Source: National Weather Service, 2020

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Qualitative Assessment of Tornado Vulnerability

Like many other hazards detailed in this report, tornadoes can occur very quickly and do not specifically impact one area of the county higher than another. The sample size taken for the Volusia County area to map tornado paths (as shown on the previous page) only covers a 69-year period, so any delineation of vulnerabilities to specific areas would be unfounded. However, on the statewide scale, trends have been identified and will be described below. Many patterns have emerged in terms of the types of tornadoes that tend to hit Volusia County. There are two primary types of tornado systems that hit.

In Florida, large tornadoes (in the EF-2 to EF-4 range) have typically been concentrated near the central portion of the peninsula (near the Orlando Metropolitan area), moving west-southwest to east-northeast and covering large swaths of land. In the case of a large tornado, the most likely area of Volusia County to be hit initially would be areas in the western portions of the county, specifically those areas that are adjacent to the boundaries with Seminole and Lake County. While warnings for tornado emergencies can be very last-minute, data tends to show that large tornadoes in Florida tend to strike the east coast after tornado activity (or pre-tornado activity) has already been identified across the western and central portions of the peninsula.

The second (and more common) type of tornado to hit Volusia County would be a small tornado, more than likely in the EF-0 to EF-1 range. These storms do not follow large-scale patterns like larger tornadoes in Florida can; thus, warnings for these types of storms can be minimal (or nonexistent) and the locations where these tornadoes strike can have a larger element of randomness. These events tend to unravel quickly and without notice. As stated above, while no clear geographic pattern has emerged for smaller-scale tornadoes in Volusia County, a disproportionate number have hit areas close to the Intracoastal Waterway during the 64-year observation period. Five tornadoes on record have crossed Interstate-95 in Volusia County.

Since strong patterns have not emerged for the most likely event (EF-0 or EF-1 tornado), larger tornadoes can develop over longer periods of time and can affect critical facilities anywhere within the county, as discussed above. Thus, critical facilities at the highest risk for strong tornado damage (and loss of human life) would generally be those located in the western portion of the county due to the shorter duration of time allowed for mitigation of these properties in the event of an incoming storm. As shown in table 6.11, there is a small chance that an individual parcel will be affected by a tornado as compared to the other hazards identified in this report.

Although tornado events are rare, tornadoes can have devastating effects on buildings. Infrastructure can be completely lost in a tornado, so the weighted risk of these events (when comparing the probability of the event with the damage incurred during the event) are very high, if not comparable to the other hazards identified within this report. Older buildings are at higher than normal risk for tornado damage as a result of strict building codes over time. In conclusion, tornadoes present a rare but dangerous threat to the county.

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HYDROLOGIC HAZARDS

6.10 COASTAL EROSION

All of the coastal areas in Volusia County are prone to coastal erosion, and nearly half of the 47 miles of shoreline are considered critically eroded. Populations are not explicitly threatened by coastal erosion. However, major economic losses can be incurred to beachfront properties due to coastal erosion. Coastal erosion is typically measured as the annual shoreline change for a given beach cross-section of profile over a long period of time. The NCDC has reported five events involving coastal erosion in Volusia County since 1998. However, these events also include losses from hurricane impacts such as storm surges. The NCDC reported events include losses for jurisdictions outside of Volusia County. As such, it is not possible to determine annualized losses from coastal erosion for the coastal jurisdictions in Volusia County. Coastal erosion exposure was assessed by quantifying the number of people and property that are located within 0.5 miles inland from the shoreline in areas where critical erosion has been documented by the Florida Department of Environmental Protection.

Table 6.12 provides the number of people and number and value of improved properties that are susceptible to coastal erosion. Coastal erosion is very likely to continue impacting the coastal areas of Volusia County. There are currently over 5,000 improved properties that are at risk to coastal erosion in Daytona Beach, Daytona Beach Shores, New Smyrna Beach, Ormond Beach and areas in unincorporated Volusia County. Jurisdictions with critically eroded beaches in Volusia County actively participate in the federal beach nourishment program.

TABLE 6.12: Total Exposure from Coastal Erosion

JURISDICTION	AT-RISK AREAS (within 200 feet of oceanic shoreline)			
	Total Number of Parcels at Risk	Number of Residential Parcels at Risk	Total Value of Buildings at Risk	Population (2017)
Daytona Beach	98	50	\$103,147,299	68,055
Daytona Beach Shores	183	117	\$115,741,404	4,514
New Smyrna Beach	234	200	\$79,120,795	26,470
Ormond Beach	144	117	\$111,599,182	42,816
Ponce Inlet	120	86	\$31,023,351	3,241
Unincorporated	13,497	349	\$2,322,057,635	----

Sources: Volusia County Property Appraiser Data (2019)

Qualitative Assessment of Coastal Erosion Vulnerability

Coastal erosion is a considerable threat to beachfront properties within five jurisdictions of the county alongside unincorporated areas. More than 5,000 parcels are at direct risk for coastal erosion, representing more than \$800 million in property value. Properties at the highest risk are those with low elevations, as wave action and dune-degradation can affect the integrity of the lot foundation. Parcels with lower foundations, or those that have not been mitigated (or raised above base flood elevation) are at higher risk for water damage, loss of personal property, electrical damage, structural collapse and loss of life. The most susceptible cities to coastal erosion within the county are Daytona Beach and New Smyrna Beach, which account for a large percentage of shoreline properties. Moreover, from a financial risk perspective, storm surge presents a unique challenge, as beachfront properties are typically the

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higher-valued properties within the county. The county's Lifeguard Headquarters and Administration Building is located on the beach in Daytona Beach and provides public safety and lifeguard duties to all the beach area. The Ponce Inlet Lighthouse is at risk and has had extensive work done around by the US Army Corps of Engineers to re-nourish the sand and install rock jetties in the inlet area. Beach renourishment was also completed after the 2004 hurricane season all along New Smyrna Beach from a spoil island in the Halifax Intracoastal River.

There are two piers with restaurants that are susceptible to storm surge with Joe's Crab Shack on the Main Street Pier being a major tourist draw to the Boardwalk Entertainment Area of Daytona Beach. The entire shoreline along with the condominiums, residential homes, businesses, and restaurants can be susceptible to coastal erosion depending on the strength and direction of the storm. The North Peninsula State Recreation Area in Ormond-By-The-Sea and A1A roadway in the area is at higher risk than other areas in the county but is rural and mostly undeveloped.

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6.11 DROUGHT

Volusia County is uniformly vulnerable to drought. Drought is typically associated with crop damage, and not necessarily the built environment (i.e., improved property). However, research (as noted in the *Hazards Profiles* section) has shown that drought conditions have caused wildfires in 1985, 1988, 1998 and 2009. Droughts can impact the Florida Aquifer, which can affect the supply of water to Volusia County residents. Many residents receive their water from personal wells and the County's public water supply is also drawn from wells. Drought can cause crop loss, livestock reductions, fish habitat disruption, and can also be associated with the increase of wildfire threat, which in turn places both human and wildlife population at highest risk. Moreover, reduced lake and canal depths can impact boating traffic and access to certain waterways, further reducing property values in these locations. The Lake Beresford area in DeLand has a large tourist draw for fishing and house boat rentals which could be impacted by severe drought conditions. The St. John's River can be impacted by drought from other areas as far south as Lake Okeechobee because it runs from south to north.

Losses were estimated based on occurrences that were reported to the NCDC⁷. To estimate losses due to extreme drought, NCDC historical drought loss data for occurrences in the County were used to develop an extreme drought stochastic model. In this model:

- Losses were obtained and scaled for inflation⁸
- Average historic extreme wind damageability was used to generate losses for historical thunderstorm wind events where losses were not reported⁹
- Expected annualized losses were calculated through a non-linear regression of historical data¹⁰
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 6.13 shows total exposure and potential annualized property losses and percent loss ratios resulting from drought for Volusia County. Although, the annualized losses are \$0, it should be noted that drought conditions can exacerbate wildfire potential. Wildfire losses are not quantified in this assessment, as drought related (i.e., wildfire) losses are reported separately. Wildfire exposure and losses are provided in this vulnerability assessment as a separate hazard. The probability of drought events in Volusia County is high. The table below depicts drought criteria as determined by the NWS.

Table 6.12: National Weather Service Drought Criteria

National Weather Service Alerts	
Alert	Criteria
D0 Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D1 Moderate Drought	Some damage to crops, pastures, streams, reservoirs, or wells low, some water shortages developing or imminent, and voluntary water-use restrictions requested.
D2 Severe Drought	Crop or pasture losses are likely, water shortages common and water restrictions imposed.
D3 Extreme Drought	Major crop and pasture losses with widespread water shortages or restrictions.
D4 Exceptional Drought	Exceptional and widespread crop and pasture loss, shortages of water in reservoirs, streams, and wells creating water emergencies.

Source: National Weather Service

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TABLE 6.14: Total Exposure and Potential Annualized Losses from Drought

JURISDICTION	EXPOSURE (TOTAL IMPROVED VALUE OF PARCELS/CONDOS)	ANNUALIZED LOSSES	ANNUALIZED PERCENT LOSS RATIO
Daytona Beach	5,036,150,652	0	0.000%
Daytona Beach Shores	235,084,140	0	0.000%
DeBary	1,458,448,319	0	0.000%
DeLand	2,429,373,658	0	0.000%
Deltona	4,758,973,858	0	0.000%
Edgewater	1,342,087,145	0	0.000%
Holly Hill	565,510,613	0	0.000%
Lake Helen	140,464,924	0	0.000%
New Smyrna Beach	2,761,841,839	0	0.000%
Oak Hill	117,259,007	0	0.000%
Orange City	784,734,035	0	0.000%
Ormond Beach	3,485,721,297	0	0.000%
Pierson	79,895,417	0	0.000%
Ponce Inlet	321,498,032	0	0.000%
Port Orange	4,016,512,204	0	0.000%
South Daytona	630,136,924	0	0.000%
Unincorporated	11,005,217,616	0	0.000%
TOTAL	\$39,168,909,680	\$0	0.000%

Sources: National Climatic Data Center, HAZUS-MH, Volusia County Property Appraiser Data (2019)

Qualitative Assessment of Drought Vulnerability

While droughts do not have physical effects on the building stock within the county, many indirect losses can occur to personal property and critical facilities as a result of drought conditions. Thus, annualized losses are not easily identifiable. Agricultural areas are throughout the county but the northwest area including the Town of Pierson is most vulnerable. Losses within the agricultural industry, specifically, can have a trickle-down effect on local businesses (such as tool or heavy machinery companies), resulting in indirect financial losses to businesses and institutions. As a result of the financial losses to individual businesses, residents of Volusia County can lose their jobs, resulting in a net economic loss for the county. Thus, the most realizable losses as a result of a drought are financial – not physical – as is the case with the other hazards identified in this report. The urbanized communities along the coast are less vulnerable economically due to their location and non-agricultural economic base.

A second indirect loss as a result of loss is physical, but comes in the form of a sinkhole. Data suggests that both an excess of rainfall (flooding) and drought conditions can have negative effects on the limestone bed in the state of Florida. Thus, the main physical deterioration as a result of drought conditions to the county's building stock could come in the form of a sink hole, which is also discussed in this report.

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6.12 FLOOD

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using FEMA's preliminary Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for improved properties that were confirmed to be located within an identified Zone A/AE (100-year floodplain), Zone VE (100-year coastal flood zone, associated with wave action), and Zone X (500-year floodplain). It is recommended that the flood analyses be revised once the new flood maps are available. Flooding can impact all populations, primarily those who live, work or recreate anywhere within the county. Flooding can also cause property loss to structures located within the 100-year floodplain.

Table 6.14 (on the next page of this document) lists the land uses of properties, the percentage of properties and the property values that are located in the 100-year (A/AE), coastal and 100-year (VE) floodplains. **Table 6.14** corresponds with **Figure 6.8**, which depicts all 100-year flood hazard zones. For a listing and generalized map of all Repetitive Loss Properties within the County and its 16 jurisdictions, please reference the 2020 Floodplain Management Plan attachment (Appendix I). Alongside the Floodplain Management Plan, many repetitive loss properties are listed in the Mitigation Action Plan as part of this report. The table below summarizes types of flooding advisories.

FIGURE 6.11: National Weather Service Alerts

Alert	Criteria
Flood Watch	Atmospheric conditions over a large area, varying in size from multiple counties to multiple states, support the development of heavy rain and/or thunderstorms that are capable of producing flooding. A flood watch implies a longer period of relatively lighter rains, adding up to a large amount of rain. Longer-term flooding implies a slower or steadier rise in the water levels of creeks, streams and larger rivers. Roads can also become flooded, but it is usually more gradual, allowing motorists to monitor conditions more closely.
Flood Warning	A Flood Warning is issued by the National Weather Service when heavy rain has been occurring, and flooding is either occurring or will occur within a specified time, usually within 60 minutes.
Flash Flood Watch	Implies a shorter period of heavier rain. Generally, if flooding is expected within six hours of the onset of rain, a Flash Flood Watch is most appropriate. Flash flooding by definition suggests rapidly rising water, such as a surge of water heading rapidly downstream in a creek or small river. It could also be rapidly rising water on roadways, which can cause motorists to become stranded in vehicles, or even worse, washed into creeks and small rivers due to rapid runoff.
Flash Flood Warning	Atmospheric conditions over a large area, varying in size from multiple counties to multiple states, support the development of heavy rain and/or thunderstorms that are capable of producing flash flooding: A Flash Flood Warning is issued by the National Weather Service when heavy rain has been occurring, and flash flooding is either occurring or will occur within a specified time, usually within 60 minutes.
Urban and Small Stream Advisory	Flooding of small streams, streets and low-lying areas, such as railroad underpasses and urban storm drains is occurring.

Source: National Weather Service

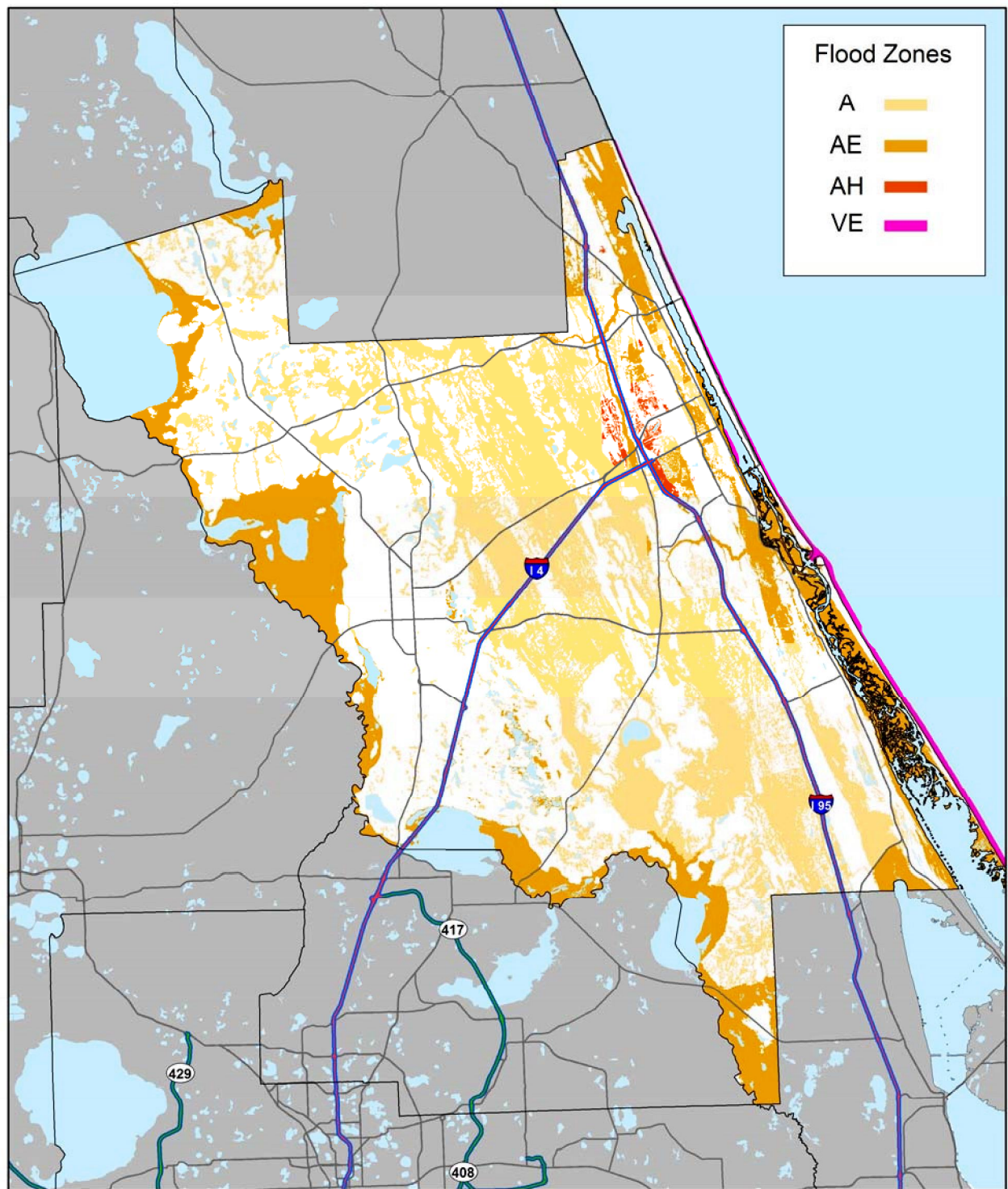
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TABLE 6.15: Parcel Exposure to Flood Hazard Zones

See Appendix I (Floodplain Management Plan) for a full floodplain analysis. Jurisdictional flood risk is also available in Appendix G.

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FIGURE 6.12: Flood Insurance Rate Zones



Source: FEMA

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Qualitative Assessment of Flood Vulnerability

Flooding is among the most prominent of hazards in Volusia County, as a large portion of the county's critical facilities, residences and businesses are located within the 100-year floodplain. The 100-year floodplain includes 22% of the county's parcels and a total of 1,200 built structures and condos, totaling close to 10 billion dollars in building value within the hazard zone. Approximately 1.6 billion dollars in assessed value and 12.5 billion dollars in taxable value is located within the 100-year floodplain (all zones) countywide.

Of the almost 2,000 buildings located within the floodplain, approximately 21% were built before 1963, 33% were built between 1963 and 1975 (Growth Management Act), 20% between 1976 and 2001 (Florida Building Code adoption), and 16% of buildings in the floodplain were built since 2002. It is recommended that the County and all jurisdictions within the county enact policies to limit or disallow future development within the 100-year floodplain.

Parcels at the highest risk for flooding damage are those with the lowest elevations. While a flood zone can envelope properties at a specified range of elevations, the variability in the elevations within those zones make certain buildings more prone to flooding damage than others. Additionally, structures that are located below the roadway system adjacent to the building (without a bio-swale buffer) are at extreme risk for flooding, as transportation networks are among the first areas to become inundated in a flood situation.

Many critical facilities are located within the 100-year floodplain. Adverse to the results when analyzing parcels within each zone on a county level, the majority of critical facilities that are located within a flood zone in Volusia County are located within Flood Zone A'. A majority of the critical facility structures located within the 100-year floodplain are located in Volusia County's beach side communities. These include fire stations in New Smyrna Beach, Ponce Inlet, Daytona Beach Shores, Daytona Beach and Palm Beach. There are hospitals at risk in low lying areas in Orange City and DeLand. Maytown Road in Oak Hill to Steen/Enterprise is not an evacuation route because of repeated flooding.

Structural damage as a result of flooding can result in a loss of electricity, which can cause communication problems throughout the county. Moreover, physical damage due to water can result in the loss of personal property (for business owners and homeowners), while heavy, often expensive equipment located within critical facilities can be damaged.

In terms of the damage incurred to structures as a result of flooding, the same types of damage can be seen as a result of storm surge. The ecological impacts hazard materials debris and accidents to land and waterways would be extensive from all types of flooding. The impacts on agriculture, tourism, and transportation would be extensive.

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6.13 STORM SURGE

The storm surge assessment was conducted by identifying the people and property that are located in storm surge inundation zones using data provided by Volusia County⁸. Storm surge affects the east side of the county, generally populations located east of Interstate 95. Storm surge can cause extensive property loss to businesses and homes; can inundate transportation networks with water and can cause long term economic losses related to tourism. The ecological impacts on turtle and bird nesting, hazard materials debris and accidents to land and waterways would be extensive from all types of storm surge.

Tables 6.16 shows the number of buildings at risk, per jurisdiction, to Category 1, Category 3 and Category 5 storm surge effects. Table **6.16** corresponds with **Figure 6.9**, which depicts the storm surge hazard zones.

TABLE 6.16: Buildings at Risk to Category 1/3/5 Storm Surge by Jurisdiction

JURISDICTION	Buildings at Risk (Cat. 1)	Buildings at Risk (Cat. 3)	Buildings at Risk (Cat. 5)
Daytona Beach	1,081	10,116	12,306
Daytona B. Shores	111	548	665
DeBary	238	239	241
DeLand	0	0	0
Deltona	1	1	1
Edgewater	314	8,802	9,827
Holly Hill	167	4,195	4,640
Lake Helen	0	0	0
New Smyrna Beach	2,263	10,444	11,088
Oak Hill	453	1,020	1,093
Orange City	0	0	0
Ormond Beach	769	7,886	11,603
Pierson	0	0	0
Ponce Inlet	306	1,055	1,243
Port Orange	1,342	9,718	12,972
South Daytona	409	4,700	4,768
Unincorporated	3,463	11,933	15,654
TOTAL	10,917	70,657	86,101

Sources: FDEM (Surge), Volusia County Property Appraiser Data (2019)

⁸ Volusia County provided surge inundation zones for Categories 1, 3 and 5.

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TABLE 6.17: 2019 Parcel Exposure to Storm Surge Zones (by Hurricane Category)

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	26,337	10,917	\$2,711,061,720	\$4,338,463,514	\$5,331,582,636	\$3,667,858,006
Category 2	57,284	31,835	\$4,391,308,643	\$8,475,200,736	\$10,272,441,228	\$7,008,481,539
Category 3	107,718	70,657	\$6,686,854,536	\$14,899,182,728	\$18,206,662,848	\$12,566,071,580
Category 4	121,092	81,635	\$7,358,068,271	\$16,833,023,268	\$20,716,856,348	\$14,330,268,535
Category 5	126,823	86,101	\$7,744,552,787	\$17,896,568,700	\$22,146,262,234	\$15,248,981,591

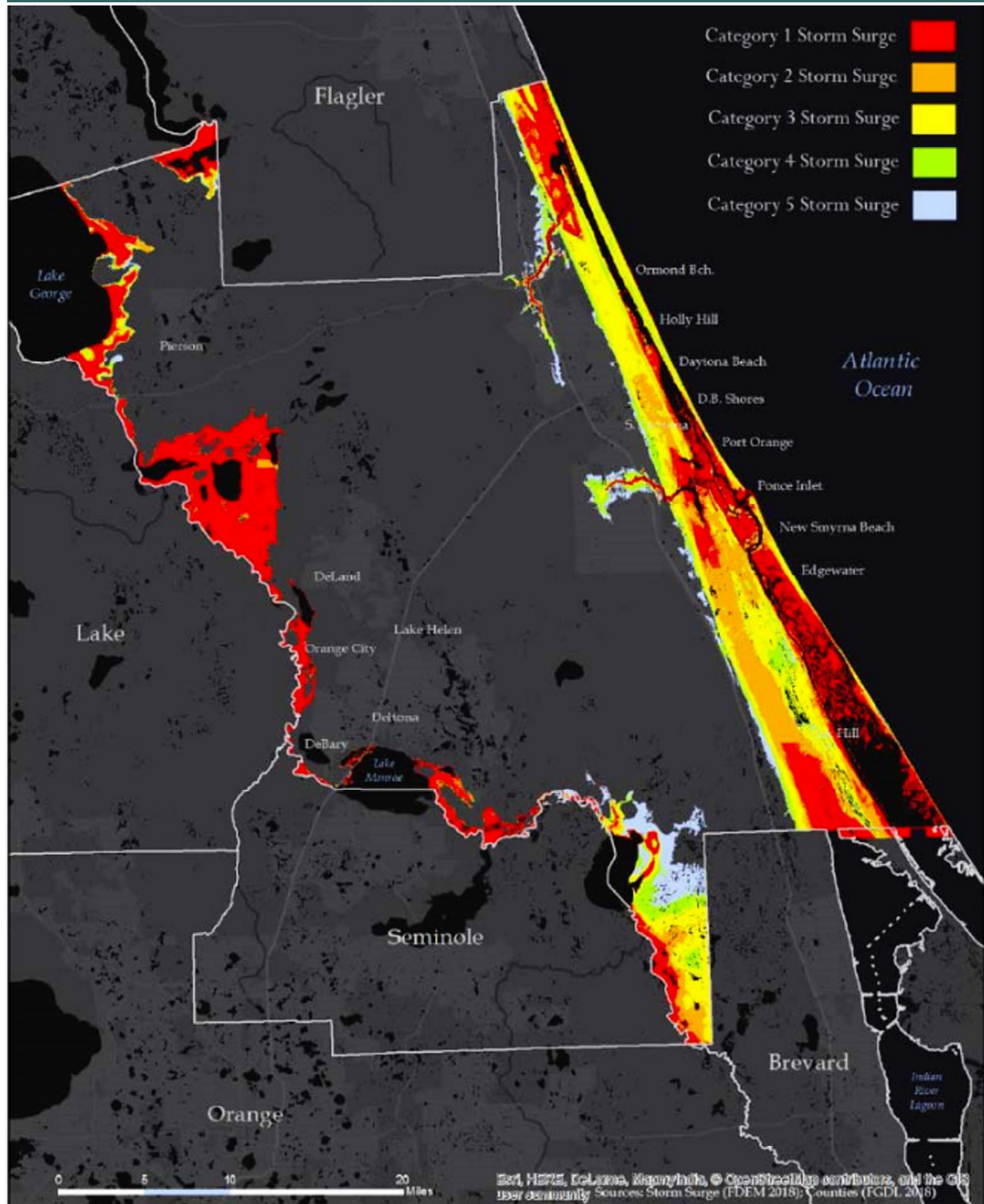
Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
Category 1	10,917	1,686	1,311	1,940	1,459	4,521
Category 2	31,835	4,924	3,982	6,190	3,959	12,780
Category 3	70,657	14,429	8,083	13,174	7,720	27,251
Category 4	81,635	16,707	9,036	15,372	9,208	31,312
Category 5	86,101	17,066	9,590	16,123	10,034	33,288

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
Category 1	9,737	625	244	298	573	14,860
Category 2	28,892	1,781	697	647	935	24,332
Category 3	64,383	3,908	1,387	1,507	1,161	35,372
Category 4	74,916	4,327	1,459	1,647	1,270	37,473
Category 5	79,096	4,422	1,606	1,750	1,477	38,472

Sources: FDEM 2017 Surge, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO
 Note: All Storm Surge Zones are cumulative (ex: Category 3 zone includes Zone 1, Zone 2 and Zone 3 parcels)

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FIGURE 6.13: Storm Surge Zones by Category



Source: FDEM Storm Surge (2017)

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Storm Surge Vulnerability

As shown in Figure 6.13 on the previous page of this report, the eastern portion of Volusia County is susceptible to storm surge conditions. In the worst-case scenario (a Category 5 Hurricane), the storm surge would be seen almost as far inland as Interstate 95. Western Volusia County is not susceptible to storm surge risk.

The eastern portion of the county contains single and multi-family housing, businesses, restaurants, hotels, tourist attractions, cemeteries, along with critical facilities and utility and transportation infrastructure that is vulnerable to storm surge.

Spruce Creek, located in central Volusia County, connects to Ponce Inlet and the Intracoastal Waterway and could possibly incur storm surge inundation to properties west of Interstate 95. Similar to this situation, the Tomoka River, located in northern Volusia County, could cause inundation to lands west of Interstate 95 in the Daytona Beach, Holly Hill and Ormond Beach areas.

Critical facilities, businesses and homes can expect to see losses due to storm surge damage that would be comparable in nature to losses due to flooding. Water entering homes can have devastating impacts on personal property (including expensive equipment in critical facilities) and can also cause loss of life. Depending on the elevation of a structure, storm surge can also affect beachfront parcels with damage comparable to that seen with coastal erosion. Lot foundations can be compromised in these situations, creating an incredibly unstable situation and the possibility for loss of life.

A total of 167 'core' critical facilities are located within the Category 1 through 5 storm surge hazard zones (46% of all facilities). A total of 4 are located in the Category 1 zone, 43 (total) are located in the Category 2 zone, 123 (total) are located in the Category 3 zone, 162 (total) are located in the Category 4 zone and 167 (total) are located in the Category 5 zone. The critical facilities at highest risk for damage include those located east of the Intracoastal Waterway or those located in close proximity to the Spruce Creek or Tomoka River. There are fire stations and city halls located on the barrier island in Ponce Inlet and Daytona Beach Shores that must be evacuated and are susceptible to storm surge. The county's Lifeguard Headquarters and Administration Building is located on the beach in Daytona Beach and provides public safety and lifeguard duties to all the beach area. Daytona Beach Fire Department has a fire station on Beach Street directly on the Halifax River which is susceptible. All low-rise bridges along the Halifax Intracoastal River would be susceptible to storm surge including Highbridge, Main Street, Silver Beach, and the North Bridge in New Smyrna Beach while the bases of the 4 high rise bridges could also be at risk. The Ponce Inlet Lighthouse is at risk and has had extensive work done around by the US Army Corps of Engineers to re-nourish the sand and install rock jetties in the inlet area. There are two piers with restaurants that are susceptible to storm surge with Joe's Crab Shack on the Main Street Pier being a major tourist draw to the Boardwalk Entertainment Area of Daytona Beach.

126,823 parcels within the county are located within a Storm Surge Zone, representing more than 15 billion dollars in taxable property value. If a category 5 storm were to hit the county – based on these figures – total losses to the county could surpass one billion. The category 5 storm surge zone also includes 86,101 parcels with built structures, 17,066 of which were built before 1970. The disproportionately older stock of buildings heightens the risk for storm surge-induced damage in Volusia County. The impact on the tourism industry would be significant throughout the county in a category 5 hurricane scenario.

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GEOLOGIC HAZARDS

6.14 SINKHOLE

Based on historic incidents, the unincorporated areas of Volusia County have been vulnerable to sinkhole hazards, with 78 occurring in the study region between 1973 and 2005. Per the *Hazards Profiles* section, most of the county is at a low to very low risk from sinkholes. However, there is an area within the unincorporated western part of the county that is at medium risk to sinkhole hazards. FDEP data was used to determine the number of people and improved properties that are susceptible to sinkhole hazards. Sinkholes are quite rare from a national perspective, and the East Central Florida Region and Volusia County are at a much higher risk than most other areas of the country. These occur in Florida largely due to the presence of limestone and water beneath Florida's surface, which can sometimes create a vacuum effect and envelope entire structures and plats of land. All structures, utilities, systems and populations are equally vulnerable.

The table below depicts the types of sinkholes. All three of these sinkhole types are common in Florida.

FIGURE 6.14: Sink Hole Types

Sinkhole Types	
Category	Criteria
Collapse Sinkholes	Collapse sinkholes are the most dramatic of the three sinkhole types; they form with little warning and leave behind a deep, steeply sided hole. Collapse occurs because of the weakening of the rock of the aquifer by erosion and is often triggered by changes in water levels in the Floridan aquifer.
Subsidence Sinkholes	The progression of a subsidence sinkhole is shown below. Rainwater percolates through overlying sediments and reaches the limestone, dissolving the rock and gradually weakening its structural integrity. Gradually subsiding sinkholes commonly form where slow dissolution takes place, mostly along joints in the limestone. These sinkholes tend to form naturally and are not greatly affected by human activities.
Solution Sinkholes	Solution sinkholes form where the overburden is absent and the limestone is exposed at land surface. This type of sinkhole usually forms as a bowl-shaped depression with the slope of its sides determined by the rate of subsidence relative to the rate of erosion of the walls of the depression from surface runoff. Surface runoff may also carry sand and clay particles into the depression, which may form a relatively impermeable seal in the bottom. A marsh or lake forms when water is ponded because infiltration is restricted by the clayey seal. The gently rolling hills and shallow depressions typical of solution-subsidence topography are common over large parts of Florida

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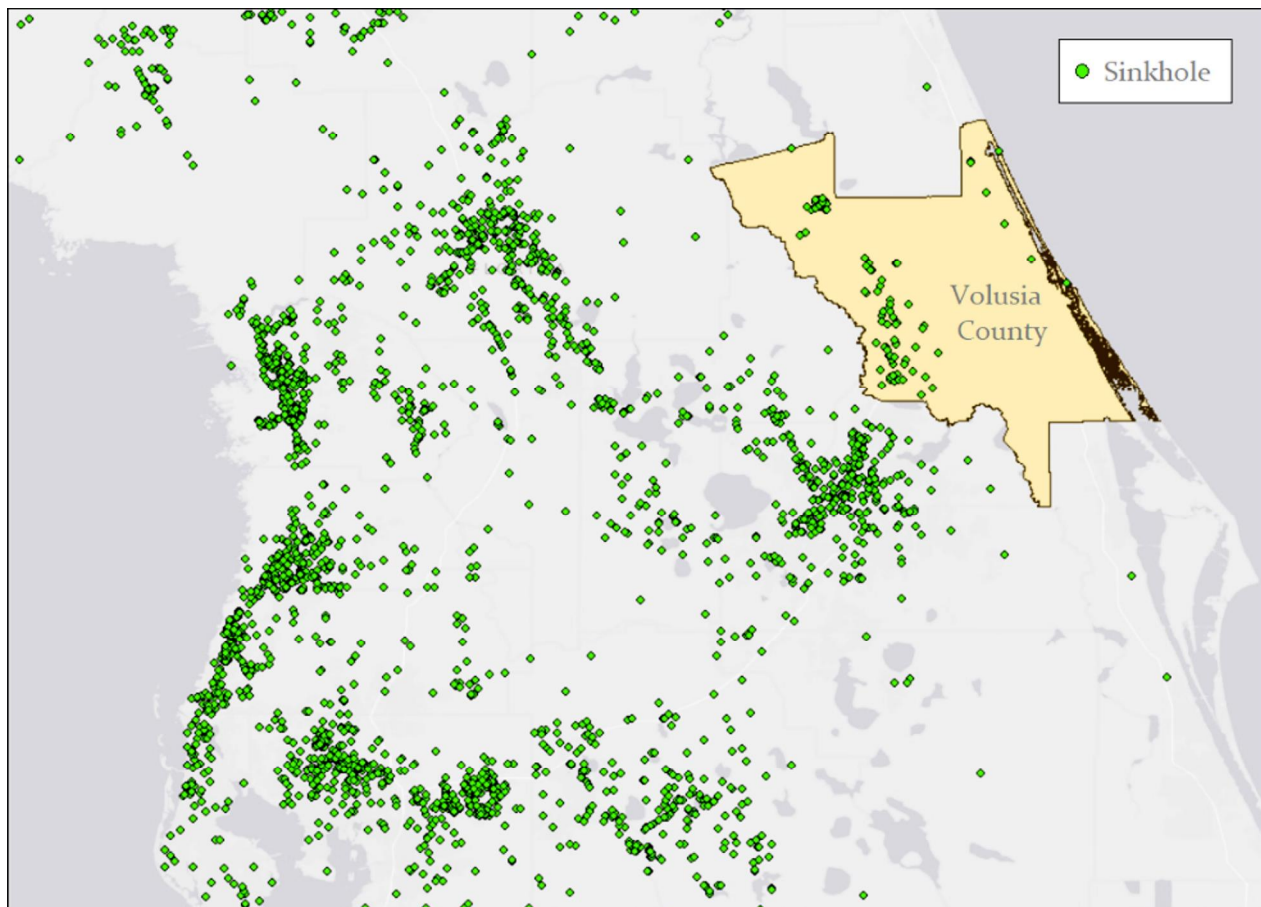
Qualitative Assessment of Sinkhole Vulnerability

The following map depicts sustenance reports in Florida that have been reported to the Florida Department of Environmental protection. This data is relevant for the state of Florida as of October 21, 2019 and depicts the statewide scale as opposed to the county scale for a reference of where Volusia County stands from a regional-risk perspective. It is important to note that Florida is at heightened risk for sinkholes relative to other areas of North America.

From a spatial risk perspective, the map below clearly shows that the western and southwestern portions of Volusia County are at a heightened risk for sinkholes and sustenance issues. The communities of DeBary, DeLand, Deltona, Orange City, Lake Helen, Stone Island and DeLeon Springs are specifically at heightened risk. Agricultural use of water impacts the risk of sinkholes by depleting the underground source of water. No particular population is at more risk than others from sinkholes. Critical infrastructure at risk in this area includes Florida Hospital in Orange City and DeLand. Interstate 4 through the west side of the county is at risk as well as Howland Blvd in Deltona are main thoroughfares and evacuation routes. Sinkholes can have completely devastating effects on homes, businesses and critical facilities, often resulting in the complete loss of the structure. In contrast to hazards such as tornadoes that strike quickly and can completely destroy structures, sink holes tend to develop slowly and grow over time. Thus, loss of personal property or non-ferrous property can be greatly reduced in the event of a sinkhole. However, sinkholes can open suddenly, which can cause loss of life and personal property.

Documented Sinkholes (2019)

Source: Florida Department of Environmental Protection



SECTION 6: VULNERABILITY ASSESSMENT

6.15 TSUNAMI

Although, historically there have been no occurrences of tsunamis in Volusia County, the potential exists. The likelihood is low, but the consequences would be catastrophic. The worst-case scenario for Volusia County would be a 3-foot wave that could reach as far as 300 feet inland, meaning that properties and populations within this zone would be affected more severely.

Table 6.17 lists the improved property values that are located in the tsunami inundation zone, based on Volusia County GIS data. There were several gaps in the data that excluded the barrier islands along the shoreline. These areas appeared to be susceptible to tsunami inundation and/or potential uninhabitability due to infrastructure loss in low lying areas. To be conservative, the analysis was performed by accounting for these barrier island areas as well.

**TABLE 6.18: Volusia County
Improved Property at Risk to
Tsunami**

JURISDICTION	Approximate Value of Improved Parcels/Condos at Risk*
Daytona Beach	2,319,787,186
Daytona B. Shores	166,793,077
DeBary	0
DeLand	0
Deltona	0
Edgewater	0
Holly Hill	0
Lake Helen	0
New Smyrna Beach	1,855,126,270
Oak Hill	0
Orange City	0
Ormond Beach	2,084,953,901
Pierson	0
Ponce Inlet	321,497,424
Port Orange	1,840,551,899
South Daytona	628,731,068
Unincorporated	3,168,225,110
TOTAL	\$12,385,665,935

Source: Volusia County Property Appraiser Data 2019*

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Tsunami Vulnerability

Table 6.18 on the previous page shows that a large portion of beachside Volusia County's population is at risk of being affected by a tsunami. While these events are extremely rare, it is important to note that more than 100,000 individuals would be at risk for this type of hazard.

Tsunamis can cause incredible loss of life and often strike without warning in the developing world. However, Volusia County would more than likely have a public warning announced and have several hours notice. However, even in lieu of a warning, evacuation of citizens located to the east of the Intracoastal Waterway could be a tough endeavor due to the lack of transportation infrastructure connecting it to the west of the waterway. Warning signs of an impending tsunami include a retreating shoreline or large, visible waves offshore, which could increase the number of casualties as a result of human intrigue. The large tourist presence in Volusia County is another compounding risk element that must be dealt with, as these individuals are less likely to know how to react to such an event.

Daytona Beach, Port Orange, New Smyrna Beach and Ormond Beach have the highest risk of loss in the future as a result of a tsunami, while the western portion of the county has no risk. The most-likely scenario for a tsunami in Volusia County would be triggered by a seismic event in Puerto Rico or off of the western coast of Africa. Such events can affect populations thousands of miles away.

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OTHER HAZARDS

6.16 WILDFIRE

Volusia County is uniformly exposed to wildfire risk, especially during the hot dry summer months and drought conditions. HAZUS data was used to determine the number of people and improved properties that are susceptible to medium and high wildfire risk. The HAZUS wildfire potential risk map accounts for the mode of fuel types to determine the risk category. Each fuel model was assigned a code (i.e. Low, Medium, or High) based on the fires spreading potential during a climatologically dry year. The fuel models indicate the ability of a fire to start and spread in the given terrain type, and are used as the input to the Fire Potential Index as well as fire spreading models. Wildfires in Volusia County and most of its municipality's impact wooded areas with low population density but do pose more of a risk to rural areas. Wildfires generally do not pose high risks to large population centers. Fires can have devastating effects on structures and can cause injuries and death due to smoke inhalation. Buildings, infrastructure, critical facilities and housing for vulnerable populations have some impact by wildfires.

Table 6.18 lists the number of properties, the percentage of properties and the property values that are located in the medium and high-risk wildfire zones. **Table 6.19** depicts exposure to different fire hazard zones utilizing 2014 parcel data. This analysis was not re-performed in 2019. See the table on the following page for additional information on fire risk.

TABLE 6.19: Volusia County Improved Property at Risk to Wildfire

JURISDICTION	# of Improved Parcels/Condos at Risk	% of Improved Parcels at Risk	Value of Improved Parcels at Risk
Daytona Beach	2,822	12.222	\$62,224,222
Daytona B. Shores	1	0.122	1,022,664
DeBary	2,222	44.222	226,128,812
DeLand	2,282	22.282	168,260,222
Deltona	6,482	12.222	\$22,222,202
Edgewater	1,264	12.212	\$6,200,221
Holly Hill	222	12.162	48,418,282
Lake Helen	222	20.202	22,218,822
New Smyrna Beach	2,222	26.242	286,222,220
Oak Hill	222	44.212	12,212,018
Orange City	412	12.222	81,682,822
Ormond Beach	4,861	21.202	420,224,680
Pierson	261	61.122	12,246,221
Ponce Inlet	222	22.212	22,468,420
Port Orange	2,224	22.122	424,228,041
South Daytona	642	14.122	44,228,602
Unincorporated	18,622	40.262	1,422,024,241
TOTAL	51,871	27.73%	\$4,167,039,562

Source: Volusia County Property Appraiser Data (2014), HAZUS-MH; see next page for analysis using 2019 parcel data

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TABLE 6.19: 2019 Parcel Exposure to Fire Hazard Zones

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
Very High Risk	124,271	104,426	\$4,844,779,396	\$16,550,254,199	\$20,902,299,006	\$13,440,592,313
High Risk	57,662	41,083	\$13,440,592,313	\$8,753,064,108	\$11,683,167,016	\$7,845,468,152
Low Risk	105,868	56,455	\$5,941,223,508	\$13,851,144,023	\$16,817,455,128	\$11,056,579,326

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
Very High Risk	104,426	11,786	10,174	22,092	15,782	44,592
High Risk	41,083	974	1,549	5,051	8,211	25,298
Low Risk	56,455	12,692	5,184	8,072	4,699	25,808

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other/Vacant
Very High Risk	99,842	3,437	744	1,157	621	18,470
High Risk	38,971	845	492	510	2,579	14,265
Low Risk	49,870	3,662	1,307	1,540	4,703	44,786

Sources: HAZUS-MH, Volusia County Property Appraiser Data (2019) – Some parcels were not provided a land use code by VCPAO

The table shown below depicts the different types of fire warnings that have been identified by the National Weather Service (NWS).

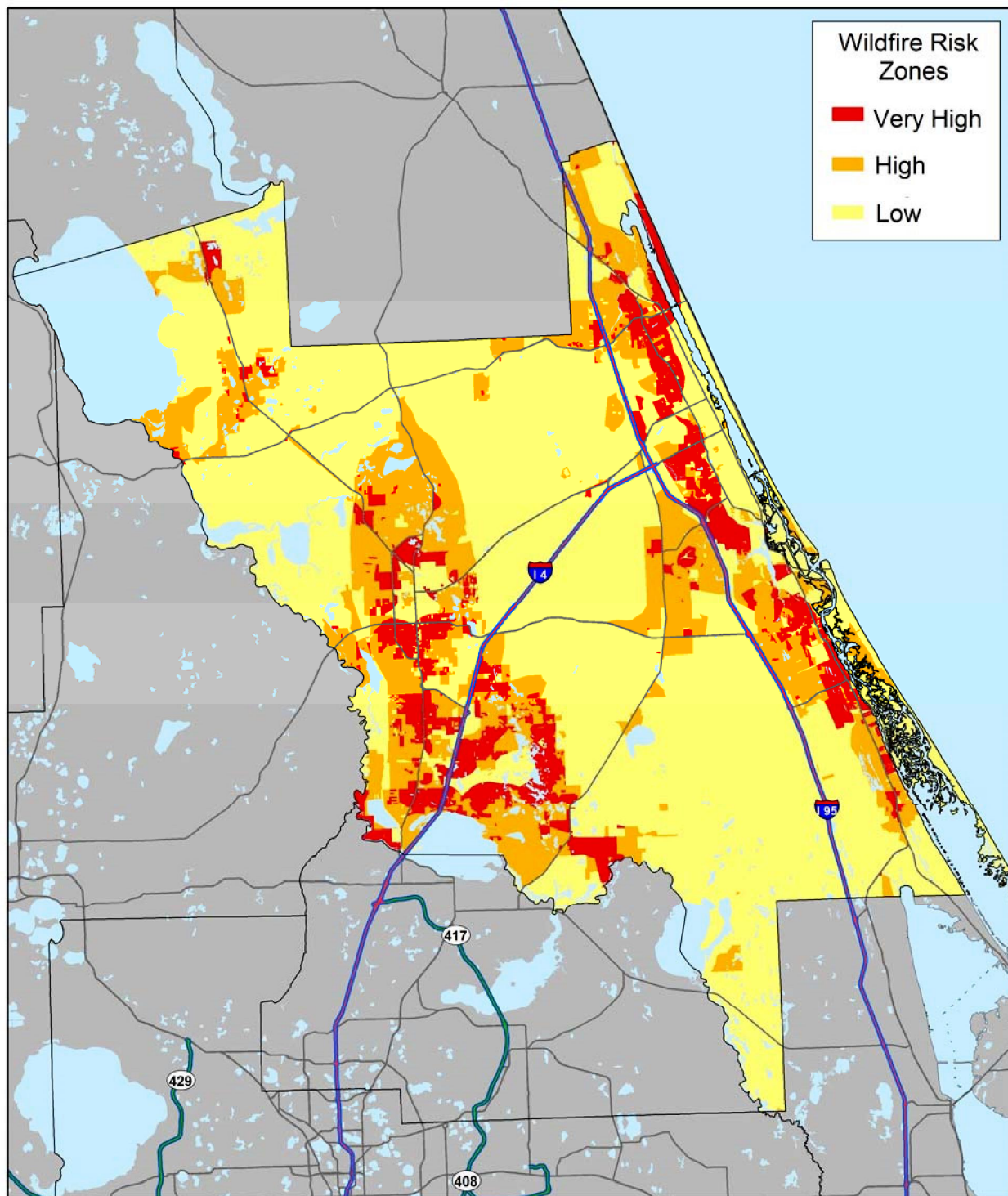
FIGURE 6.15: Fire Advisory Types

Alert	Criteria
Fire Weather Watch	Conditions are favorable for red flag conditions in and close to the watch area in the next 12 to 48 hours.
Red Flag Warning	Issued for weather events which may result in extreme fire behavior that will occur within 24 hours. Red Flag criteria occurs whenever a geographical area has been in a dry spell for a week or two, or for a shorter period, and the National Fire Danger Rating System (NFDRS) is high to extreme and if there is a sustained wind average 15 mph or greater, a relative humidity less than or equal to 25 percent, and a temperature of greater than 75 degrees F.

Source: National Weather Service

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FIGURE 6.16: Fire Hazard Zones



Source: HAZUS-MH

SECTION 6: VULNERABILITY ASSESSMENT

Qualitative Assessment of Fire/Wildfire Vulnerability

Table 6.19 shows that a large portion of Volusia County is susceptible to fires. 124,271 parcels within the county are located within the 'Very High Risk' zone, accounting for a total of 104,426 parcels with structures. An additional 57,662 parcels within the county are located within the 'High Risk' zone, accounting for a total of 41,083 parcels with structures that are threatened by fire.

The build year of a parcel is extremely important (perhaps the most important) metric to look at when analyzing risk as a result of fires. This is due to the adoption of building codes over time. Building codes can limit the types of materials utilized on buildings, along with other mitigating strategies, therefore reducing the risk for newer structures within the county. While the county has an older building stock, the parcels that are at risk for fire within the county are generally newer as compared to the parcels vulnerable to other hazards. The Ormond Beach rural area along SR 40 west of I-95 is a very susceptible area with many heavily wooded single-family subdivisions such as Timber Creek, Hunters Ridge, Breakaway Trails, and Plantation Pines.

In terms of land use, the majority of the parcels within the fire hazard zones are low density residential. More than 236,000 low density residential parcels are located within the 'High' and 'Very High' risk zones. More than 15,000 businesses are located within the 'High' and 'Very High' risk zones.

In addition to structures susceptible to fire, many areas of Volusia County are agricultural, while there are also many wood lands within the county. These areas are extremely susceptible to wildfires. Wildfires can spread in two ways: Burning ashes from tree lines can 'jump' across roadways or other barriers, widening the scope of the fire event. The second method of wildfire spread is less visible, as wildfires have the ability to transfer energy underground, making for an invisible spread of the wildfire. Often times, the fire does not have to be actively 'burning' for a spread to occur. This incredibly heightens the risk for residents living in isolated rural areas surrounded by trees.

SECTION 6: VULNERABILITY ASSESSMENT

6.17 SEA LEVEL RISE

Sea level rise, caused by changes in the Earth's climate, is a phenomenon resulting from a consistent change in the Earth's surface temperature that leads to changes in climatic patterns which ultimately alters weather patterns - including atmospheric and hydrologic impacts - and leads to sea level rise.

The greatest impacts from climate change on sea level rise include storm surge and coastal flooding. Sea level rise and climate change also affect atmospheric and hydrologic patterns which in turn impact other hazards like inland flood (increased rainfall periods), drought (decreased rainfall periods), and wildfire (exacerbated by vegetative fuel growth in periods of higher rainfall and then burn risk in drier periods). During the last century, sea level has risen approximately 6-9 inches worldwide and 9 inches along the coast of East Central Florida.

The United States Environmental Protection Agency (EPA) has been analyzing the causes, effects and possible responses to sea level rise. EPA's 1995 report, *The Probability of Sea Level Rise*, estimates that if humanity continues to emit greenhouse gases into the atmosphere, mean sea level could raise 1-2 feet in the next century and 5 feet over the next 150-300 years.

Volusia County, the River-to-Sea Transportation Planning Organization, and numerous jurisdictions within Volusia County have studied the potential effects of sea level rise since the 2014 version of the Local Mitigation Strategy (LMS) was released. In addition to jurisdiction-specific analyses, a Regional Resiliency Action Plan was drafted by the East Central Florida Regional Planning Council dealing with resiliency strategies on the jurisdictional and agency-levels.

Moreover, the Florida Department of Environmental Protection awarded Volusia County a grant to study the effects of sea level rise in addition to storm surge as part of a 2019-2020 project. The information contained in the FDEP-Volusia County report (to be released after the publication of the 2020 LMS) will be formatted identically to the LMS in order for planners and emergency managers to adequately compare the two documents. This document will be available in addition to the LMS upon request from Volusia County Emergency Management.

Table 6.21 on the following page depicts countywide exposure to sea level rise levels determined by the National Oceanographic and Atmospheric Administration (NOAA) high curve for years 2040, 2070 and 2100. These time horizons and curves have been utilized in previous studies within Volusia County at the jurisdictional, transportation agency and county levels.

SECTION 6: VULNERABILITY ASSESSMENT

TABLE 6.21: 2019 Parcel Exposure to Sea Level Rise Inundation Levels

Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones						
Hazard Zone	Parcels in Zone	Built Parcels	Land Value	Building Value	Assessed Value	Taxable Value
NOAA “High Curve”, 2040	14,953	6,791	\$2,086,271,815	\$2,394,658,188	\$3,835,511,832	\$2,581,169,654
NOAA “High Curve”, 2070	31,053	14,977	\$2,962,080,894	\$4,771,631,295	\$6,199,938,559	\$4,241,498,179
NOAA “High Curve”, 2100	79,120	48,561	\$5,249,071,011	\$11,060,771,690	\$13,421,963,554	\$9,189,623,999

Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone						
Hazard Zone	Built Parcels	Built Pre-1970	Built 1970-1979	Built 1980-1989	Built 1990-1999	Built 2000-2019
NOAA “High Curve”, 2040	6,791	911	802	1,224	970	2,884
NOAA “High Curve”, 2070	14,977	2,205	1,890	2,789	1,945	6,148
NOAA “High Curve”, 2100	48,561	8,849	6,170	9,123	5,463	18,956

Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use						
Hazard Zone	Residential	Commercial	Industrial	Institutional	Conserv./Agri.	Other
NOAA “High Curve”, 2040	6,130	242	221	241	390	7,729
NOAA “High Curve”, 2070	13,420	811	415	441	722	15,244
NOAA “High Curve”, 2100	43,547	2,869	1,214	1,309	1,057	29,124

Sources: NOAA, GeoPlan Center, Volusia County Property Appraiser Data (2019) Some parcels were not provided a land use code by VCPAO

Qualitative Assessment of Sea Level Rise Vulnerability

Sea level rise is currently being studied as a threat to properties located near oceans, and many areas of eastern Volusia County would be inundated with water if sea level rise occurs as modeled by the U.S. Army Corps of Engineers. For this study, NOAA high curve data for 2040, 2070 and 2100 was utilized to study the amount of property value, the types of properties and build-year of properties located in each inundation zone.

Combined Impacts of Sea Level Rise and Hurricanes over the Long Term

The LMS project team also modeled sea level rise impacts on future hurricanes. This information was published following the completion of this report and can be requested from Volusia County Emergency Management.

SECTION 6: VULNERABILITY ASSESSMENT**6.18 CONCLUSIONS ON HAZARD VULNERABILITY**

The results of this vulnerability assessment are useful in at least three ways:

- Improving our understanding of the risk associated with the natural hazards in Volusia County through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing risk.
- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current profile of risk in Volusia County. Future updates will enable comparison of the changes in risk over time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- Comparing the risk among the natural hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate natural hazards that are present in Volusia County. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to the county.

SECTION 7: CAPABILITY ASSESSMENT

SECTION 7 – CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of Volusia County and the participating municipal jurisdictions to implement hazard mitigation activities. It consists of the following four subsections:

- ▶ **What is a Capability Assessment?**
- ▶ **Conducting the Capability Assessment**
- ▶ **Capability Assessment Findings**
- ▶ **Conclusions of the Capability Assessment**

7.1 WHAT IS A CAPABILITY ASSESSMENT?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.¹ As in any planning process, it is important to try to establish which goals, objectives and/or actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical and likely to be implemented over time, given a local government's planning and regulatory framework. This capability assessment also highlights the positive mitigation measures already in place, or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment completed for Volusia County and its jurisdictions serves as a critical planning step and an integral part of the foundation for designing an effective multi-jurisdictional hazard mitigation strategy. Coupled with the *Risk Assessment*, the *Capability Assessment* helps identify and target meaningful mitigation actions for incorporation in the *Mitigation Strategy* portion of the Hazard Mitigation Plan. It helps establish the goals and objectives for the Volusia County Region to pursue under this Plan and ensures that those goals and objectives are realistically achievable under given local conditions.

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities throughout Volusia County, a detailed *Capability Assessment Survey*² was distributed to Volusia County staff and to staff from participating local municipal jurisdictions. The survey questionnaire, which was completed by

¹ While the Interim Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step to develop a mitigation strategy that meets the needs of each jurisdiction while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c)(2)).

² The *Capability Assessment Survey* instrument used to assess county and municipal capabilities is available through Volusia County upon request.

SECTION 7: CAPABILITY ASSESSMENT

applicable local government officials, requested information on a variety of “capability indicators” such as existing local plans, policies, programs or ordinances that contribute to and/or hinder the community’s ability to implement hazard mitigation actions.

At a minimum these survey results provide an inventory of existing local plans, ordinances, programs and resources in place or under development in addition to their overall effect on hazard loss reduction. The survey instrument thereby not only helps accurately assess each jurisdiction’s degree of local capability, but also serves as a good source of introspection for those jurisdictions wishing to improve their capability. The identification of opportunities and specific actions to be proposed as part of the community’s mitigation strategy often develop as an outcome of completing a capability assessment.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this Plan to provide insight into the capacity of Volusia County and the participating jurisdictions to implement hazard mitigation activities. All information is based upon the responses provided by local government officials to the *Capability Assessment Survey*.

7.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances and programs that demonstrate a local jurisdiction’s commitment to guiding and managing growth, development and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning and transportation planning in addition to the enforcement zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built, as well as protecting environmental, historic and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision-making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development for Volusia County and the participating jurisdictions, along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms, where appropriate.

Table 7.1 provides a summary of the relevant local plans, ordinances and programs already in place or under development for Volusia County and the participating jurisdictions. An (x) mark indicates that the given item is currently in place and being implemented by the local jurisdiction, or that it is currently being developed for future implementation. A more detailed discussion on each jurisdiction’s planning and regulatory capability follows, along with the incorporation of additional information based on the narrative comments provided by local officials in response to the survey questionnaire.

Following the inventory of local plans, programs and policies is a description of each element upon which the local jurisdiction’s capability score was based.

SECTION 7: CAPABILITY ASSESSMENT

TABLE 7.1: Relevant Plans, Ordinances and Programs

JURISDICTION	Local Mitigation Strategy	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Floodplain Ordinance (or Flood Damage Prevention Ordinance)	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-disaster Redevelopment / Reconstruction Ordinance	Building Code	Fire Code	National Flood Insurance Program	NFIP Community Rating System
Daytona Beach	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Daytona Beach Shores	X	X	X		X			X		X		X			X	X		X		X	X	X	X
DeBary	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X			X	X	X	
DeLand	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Deltona	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Edgewater	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Holly Hill	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X			X	X	X	X
Lake Helen	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	
Law Smyrna Beach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lak Hill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Orange City	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	
Ormond Beach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pierson	X	X	X					X		X		X				X	X			X	X	X	
Ponce Inlet	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Port Orange	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
South Daytona	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X			X	X	X	X
Volusia County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Attachment: Volusia County LMS 2020 Part I (2020-R-22 : Volusia County Local Mitigation Strategy)

SECTION 7: CAPABILITY ASSESSMENT

The project team developed the Local Mitigation Strategy with numerous resources, including existing plans, technical information and mapping software.

ESRI ArcGIS software was used to develop vulnerability profiles for the hazards covered in this report. Data collection by the project team included municipal critical facilities, stormwater facilities and lift/pump stations, as well as parcel data collected from the Volusia County Property Appraiser. Numerous GIS files were also downloaded from Volusia County I.T. for consideration, research and use.

Technical plans were also reviewed for consistency with the Local Mitigation Strategy. This primarily included the county's Integrated Floodplain Management Plan, which was reviewed and updated alongside the 2020 LMS. The data collection, data analysis and risk profile methodologies used for the Local Mitigation Strategy and the Floodplain Management Plan are identical. The additional plans listed on the previous page, including the Volusia County Continuation of Operations Plan and others, were also reviewed as made available.

Technical information was collected primarily from the Volusia County Emergency Management Department and the National Climatic Data Center, which compiles countywide reports on past hazard events, estimated losses, and other critical information for tracking the County's vulnerabilities.

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7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. Other phases include preparedness, response and recovery. In reality, each phase is interconnected with hazard mitigation as **Figure 7.1** suggests. Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the *Capability Assessment Survey* asked several questions regarding emergency management plans in order to assess the jurisdiction's willingness to plan and their level of technical planning proficiency.

FIGURE 7.1: The Four Phases of Emergency Management



Local Mitigation Strategy (LMS): Also called a hazard mitigation plan, the local mitigation strategy represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a local mitigation strategy include a risk assessment, capability assessment, mitigation strategy and the mitigation projects list.

- Volusia County and its jurisdictions developed the first version of their local mitigation strategy in 1999 (adopted 2000) and updated the plan in 2007 and 2014. The plan is currently undergoing a revision that will be completed in January 2020.

Disaster Recovery Plan: A disaster recovery plan serves to guide the physical, social, environmental and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses.

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- Survey results indicate that 12 of the jurisdictions have their own disaster recovery plan. A potential mitigation action that should be considered is for all participating jurisdictions to develop their own disaster recovery plan that would incorporate mitigation opportunities into the disaster recovery process.

Emergency Operations Plan: An emergency operations plan outlines responsibility and the means by which resources are deployed to respond to an emergency or disaster. Many communities choose to update their emergency operations plan before events occur to better prepare for future disasters. This is an example of hazard mitigation.

- Volusia County Emergency Management maintains the emergency operations plan that also covers their respective jurisdictions. In general, emergency operations planning has been determined to have a moderate effect on loss reduction, as its emphasis focuses on preparedness and response operations rather than hazard mitigation activities.

Continuity of Operations Plan: A continuity of operations plan establishes a chain of command line of succession, and plans for backup or alternate emergency response resources in case of an extreme emergency. Developing a continuity of operation plan is an example of hazard mitigation.

- Results indicate that 15 of jurisdictions in Volusia County have a continuity of operations plan in place. Each of the other jurisdictions is encouraged to consider preparing their own continuity of operations plans as a possible mitigation action for inclusion this Plan.

7.3.3 General Planning

The implementation of hazard mitigation activities should involve agencies and individuals beyond the emergency management profession. Other stakeholders may include local planners, public works officials, economic development specialists and others. Because in many instances, concurrent local planning efforts help achieve or complement hazard mitigation goals, even though they are not specifically designed as such, the *Capability Assessment Survey* asked questions regarding each jurisdiction's general planning capabilities and the degree to which hazard mitigation is integrated into other ongoing planning efforts.

Comprehensive Land Use Plan: A comprehensive land use plan establishes the overall vision for a community, and serves as a guide for future governmental decision making. Typically, a comprehensive plan is comprised of a summary of current and expected demographic conditions, land use, transportation elements and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can greatly enhance the likelihood of achieving risk reduction goals, objectives and actions.

- All jurisdictions within the region have a comprehensive land use plan as required by state law.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending for public improvement projects. A capital improvements plan can serve as an important mechanism to guide

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future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Volusia County has a Capital Improvements Element (CIE) that is part of the Comprehensive Plan. The Capital Improvement Plan should be considered a local funding source for mitigation projects recommended as part of the Local Mitigation Strategy and the implementation of those actions will help to reduce disaster damages.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages.³ This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harms way.

- There are 10 jurisdictions that have a historic preservation plan.

Zoning Ordinances: Zoning dictates the means by which land use is controlled by a local government. As part of a community's police power, zoning is used to protect the public health, safety and welfare of those within a given jurisdiction. A zoning ordinance is the mechanism through which zoning is implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool, especially when applied in identified hazard areas.

- All of the participating jurisdictions have a zoning ordinance.

Subdivision Ordinances: A subdivision ordinance is generally intended to regulate the development of housing, commercial and industrial uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.⁴

- There are 16 jurisdictions that have a subdivision ordinance.

Building Codes, Permitting and Inspections: Building Codes regulate construction standards. In many communities permits must be issued and inspections of work must take place for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- All Volusia County jurisdictions have adopted and enforce the Florida Building Code.

³ See Protecting the Past from Natural Disasters. 1999. Nelson, Carl. National Trust for Historic Preservation: Washington D.C.

⁴ For additional information regarding the use of subdivision regulations in reducing flood hazard risk, see Subdivision Design in Flood Hazard Areas. 1999. Morris, Marya. Planning Advisory Service Report Number 499. American Planning Association: Washington D.C.

In conducting the assessment IS² collects information related to personnel qualifications and continuing education, as well as the number of inspections performed per day. This type of information, combined with local building codes, is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with the lower grade being more ideal. A ²CEGS grade of 1 represents exemplary commitment to building code enforcement, and a grade of 10 indicates less than minimum recognized protection. **Table 7.2** lists the ²CEGS ratings for the jurisdictions in the region.

JURISDICTION	BCEGS RESIDENTIAL RATING	BCEGS COMMERCIAL RATING	YEAR LAST RATED
Bayton Beach	4	2	
Bayton Beach Shores			
Beary			
BeLand			
Beltona			
Edgewater			
Holly Hill			
Lake Helen	4	4	2000
New Smyrna Beach			
Pak Hill			
Range City			
Summond Beach	2	2	2004
Pierson			
Ponce Inlet			
Port Range			
South Baytona			
Volusia County			

⁵ Participation in $\mathcal{B}$ CEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

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7.3.4 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP they must adopt a local flood damage prevention ordinance which requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event, and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community.

An additional indicator of floodplain management capability is the active participation of local jurisdictions in the *Community Rating System* (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP, adding extra local measures to provide protection from flooding. All of the 17 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class. Class ratings, which run from 10 to 1, are tied to flood insurance premium reductions as shown in **Table 7.3**. As class ratings improve (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years, based on community comments intended to make the CRS more user friendly, and extensive technical assistance available for communities who request it.

Volusia County and its 16 jurisdictions are all participants in the National Flood Insurance Program (NFIP) and 10 jurisdictions participate in the Community Rating System (CRS). Compliance with the NFIP is maintained through:

- Jurisdiction participation in the Volusia Prepares Working Group (quarterly)
- Quarterly submittal of Mitigation Initiatives by jurisdictions
- Complying with NFIP through County/Municipal Floodplain Ordinances (exceed CFR-44)
- Compliance with Florida Building Code

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TABLE 7.3: CRS Premium Discounts, By Class

CRS CLASS	PREMIUM REDUCTION
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	None

Source: FEMA

TABLE 7.4: CRS Participation in Volusia County (as of 5/1/2019)

JURISDICTION	CRS CLASSIFICATION	DISCOUNT FOR SFHA
Daytona Beach	6	20%
Daytona Beach Shores	5	25%
DeLand	7A	7A
DeLand	7A	7A
Deltona	7	5%
Edgewater	7	15%
Holly Hill	6	20%
Lake Helen	7A	7A
New Smyrna Beach	7	15%
Pak Hill	7A	7A
Orange City	7A	7A
Ormond Beach	6	20%
Pierson	7A	7A
Ponce Inlet	5	25%
Port Orange	5	25%
South Daytona	6	20%
Volusia County	5	25%

Source: Volusia County Emergency Management and FEMA

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Floodplain Management Plan: A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding the corrective and preventative measures put in place to reduce flood-related impacts. Floodplain management plans are similar to hazard mitigation plans except for the fact that they focus solely on flood hazards and identifying specific actions to address flooding problems within a jurisdiction.

- All jurisdictions have a floodplain management plan, located within the County FMP.

Stormwater Management Plan: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures intended to reduce the impact of minor urban flooding. Stormwater management plans are an excellent way for local governments to regulate stormwater flow within the jurisdiction and to prevent future stormwater problems.

- There are 16 jurisdictions that have a stormwater management plan as of 2017.

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7.4 CONCLUSIONS OF THE CAPABILITY ASSESSMENT

The capability of Volusia County and the participating jurisdictions varies greatly from jurisdiction to jurisdiction. **Table 7.5** lists the total number of jurisdictions that have plans, ordinances and programs in place or under development.

Plan, Ordinance or Program	Total Number of Jurisdictions
Local Mitigation Strategy	17
Comprehensive Land Use Plan	17
Floodplain Management Plan	17
Open Space Management Plan	15
Stormwater Management Plan	16
Natural Resource Protection Plan	17
Flood Response Plan	17
Emergency Operations Plan	17
Continuity of Operations Plan	15
Evacuation Plan	16
Disaster Recovery Plan	12
Capital Improvements Plan	17
Economic Development Plan	14
Historic Preservation Plan	10
Floodplain Ordinance (or Flood Damage Prevention Ordinance)	17
Zoning Ordinance	17
Subdivision Ordinance	16
Unified Development Ordinance	12
Post-disaster Redevelopment Reconstruction Ordinance	7
Building Code	17
Fire Code	17
National Flood Insurance Program	16
FIP Community Rating System	11

The *Capability Assessment* and *Risk Assessment* serve as the foundation for a meaningful hazard mitigation strategy. During the process of identifying the goals and mitigation actions each jurisdiction

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must consider not only their level of hazard risk but also their existing capability to minimize or eliminate that risk.

In jurisdictions where the overall hazard risk is considered to be high, specific mitigation actions that account for these conditions should be considered. This may include less costly actions such as minor ordinance revisions or public awareness activities. If necessary, specific capabilities may need to be improved in order to better address recurring threats. Similarly, in cases where the hazard vulnerability is low, more emphasis can be placed on actions that may impact future vulnerability, such as guiding development away from known hazard areas using various regulatory measures.

Use of Social Media and Other Media for Warning and Loss Prevention

Volusia County Emergency Management uses its twitter account to provide warning to residents about incoming storms and other natural hazards. In unison with social media, the County Public Information Officer and Emergency Manager stay in communication with local television stations as well as national television stations such as The Weather Channel before, during and after storm and natural hazard events). Coordination with media sources often includes tips for residents for property mitigation (such as sandbagging) and tips for residents to stay safe after a storm (including staying away from downed power lines and standing water).

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This section of the Plan provides the blueprint for Volusia County and the participating jurisdictions to become less vulnerable to its identified hazards. It is based on general consensus of the Volusia Prepares LMS Working Group (LMS Working Group) and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- ▶ **Introduction**
- ▶ **Mitigation Goals**
- ▶ **Identification and Analysis of Mitigation Techniques**
- ▶ **Selection of Mitigation Techniques for Volusia County**
- ▶ **Mitigation Success Stories**
- ▶ **Plan Update Requirement**

8.1 INTRODUCTION

The intent of the local Mitigation Strategy is to provide Volusia County and the participating jurisdictions with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques deemed available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic and functional in nature:

- ▶ In being *comprehensive*, the development of the strategy includes a thorough review of all hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high-risk hazards, but also to assist the County and participating jurisdictions achieve compatible economic, environmental and social goals.
- ▶ In being *strategic*, the development of the strategy ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- ▶ In being *functional*, each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the Mitigation Strategy includes the identification of countywide mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific, action-oriented objectives. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance), and hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

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The second step involves the identification, consideration and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process, sustained through the development and maintenance of this Plan. Alternative mitigation measures will continue to be considered as future mitigation opportunities become identified, as data and technology improve, as mitigation funding becomes available, and as this Plan is maintained over time.

The third and last step in designing the Mitigation Strategy is the selection and prioritization of specific mitigation actions, referred to as Hazard Mitigation Initiatives, for Volusia County and participating jurisdictions (provided separately in Section 9: *Mitigation Action Plan*). The Mitigation Action Plan (MAP) represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for Volusia County and its participating jurisdictions and partners to carry out with accompanying information such as those departments or individuals assigned responsibility for their implementation, potential funding sources and an estimated target date for completion, serving as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the Hazard Mitigation Plan.

In preparing the Mitigation Action Plan for Volusia County, the LMS Working Group considered the overall hazard risk and capability to mitigate the effects of hazards as determined through the risk and capability assessment process, in addition to meeting the adopted countywide mitigation goals and unique needs of the community. Prioritizing the proposed mitigation actions was based on the following 11 factors:

- ▶ Population Benefited
- ▶ Health and Safety Considerations
- ▶ Environmental Impact
- ▶ Consistency with Other Plans and Programs
- ▶ Reduces Risk of Future Property Damage
- ▶ Supports Essential or Critical Services
- ▶ Probability of Receiving Funding for Implementation
- ▶ Feasibility of Implementation
- ▶ Community Rating System
- ▶ Repetitive Loss Mitigation
- ▶ Benefit Cost Ratio (to be conducted prior to submitting a project for grant consideration)

The mitigation initiative scoring system is provided in **Table 8.1**.

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TABLE 8.1: Mitigation Initiative Scoring System

Prioritization Criteria	Scoring				
Population Benefited	4 - Project will benefit a multi-jurisdictional area.	3 - Project will benefit a jurisdictional area.	2 - Project will benefit less than 100% of a jurisdiction (i.e., neighborhood).		
Health and Safety Considerations Add 1 point for projects that benefit a multi-jurisdictional area.	4 - Project would benefit 25% or more of the population.	3 - Project would benefit 50-4% of the population.	2 - Project would benefit 25-4% of the population.	1 - Project would benefit less than 25% of the population.	
Environmental Impact	1 - Project improves the environment.	0 - Risk to the environment is undetermined.	(-1) - Project poses risk to the environment.		
Consistency with other Plans and Programs	4 - Project is incorporated into the LMS, CEMP and Comprehensive Plan, and supports the National Flood Insurance Program (i.e., for flood related projects).	3 - Project is incorporated into at least two of these plans.	2 - Project is incorporated into at least one of these plans.	1 - Project is consistent with other local standards, aside from LMS, CEMP and Comprehensive Plan.	
Reduces Risk of Future Property Damage	4 - Mitigates a hazard of high frequency or risk.	3 - Mitigates a hazard of moderate frequency or risk.	2 - Mitigates a hazard of low frequency or risk.	1 - Mitigates a hazard of very low frequency or risk.	
Supports Essential or Critical Services	5 - Project will ensure continuity of operations for essential infrastructure or services.	3 - Project will support infrastructure or services with loss/damage history.	1 - Project will support infrastructure or services without loss/damage history.	0 - Project's operation will have no impact on community infrastructure or services if disrupted.	
Probability of Receiving Funding for Implementation	4 - Limited funding potential exists.	3 - Potential funding sources are other state or federal grants or similar funding sources.	2 - Potential funding is readily available through emergency preparedness or mitigation funding sources.	0 - Potential funding is readily available through local funding sources (e.g., budgeting, capital improvements).	
Feasibility of Implementation	4 - Project would be relatively easy to implement in one year.	3 - Project would be easy to implement in three years.	2 - Project would be easy to implement in five years.	0 - Project would be difficult to implement.	
Community Rating System	4 - Project supports all four elements of CRS flood-related activities (public information, mapping and regulations, damage reduction and flood preparedness).	3 - Project supports three CRS elements.	2 - Project supports two CRS elements.	1 - Project supports one CRS element.	0 - Project does not support any CRS element.
Repetitive Loss Mitigation	4 - Project protects 50% or more of Repetitive Loss (RL) structures.	2 - Project protects less than 50% of RL structures.	0 - Project does not protect a RL structure.		
Benefit Cost Ratio	5 - Project has a Benefit Cost Ratio (BCR) of "1" or higher, using FEMA approved software.	3 - Project has a BCR of less than "1" using FEMA approved software.	0 - The BCR can not be determined.		

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8.2 MITIGATION GOALS

44 CFR Requirement

44 CFR Part 201.6(c)(3)(i):

The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

For the 2020 plan update, the LMS Working Group used the goal listing updated and developed as part of the 2014 plan update. As a result of the 2014 review, the LMS Working Group recommended that the existing goals (**Table 8.2**) remain the same. Additional goals were developed by jurisdictions as part of the Floodplain Management Plan (Appendix I). Each of the following goal statements represent a broad target for Volusia County and its participating jurisdictions and partners to achieve through the implementation of its more detailed Mitigation Action Plan provided in Section 8: *Mitigation Action Plan*. They are intended to reflect the unique needs and wishes of the communities of Volusia County to have a more "disaster resistant" future.

TABLE 8.2: Mitigation Goals

GOAL 1: LOCAL GOVERNMENT WILL HAVE THE CAPABILITY TO DEVELOP, IMPLEMENT AND MAINTAIN EFFECTIVE MITIGATION PROGRAMS

Objective 1: Data and information needed for defining hazards, risk areas, and vulnerabilities in the community will be obtained.

Objective 2: The capability to effectively utilize available data and information related to mitigation planning and program development will be available.

Objective 3: The effectiveness of mitigation initiatives implemented in the community will be measured and documented.

Objective 4: Up-to-date technical skills in mitigation planning and programming will be available for the community.

Objective 5: There will be a program to derive mitigation "lessons learned" from each significant disaster event occurring in or near the community.

GOAL 2: ALL SECTORS OF THE COMMUNITY WILL WORK TOGETHER CONTINUOUSLY TOWARD BUILDING A DISASTER-RESILIENT COMMUNITY

Objective 1: A business continuity and recovery program will be established and implemented in the community.

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Objective 2: Local agencies and organizations will establish specific interagency agreements for the development and implementation of mitigation-related projects and programs.

Objective 3: Local elected governing bodies will promulgate the local mitigation plan and support community mitigation programming.

Objective 4: Outreach programs to gain participation in mitigation programs by business, industry, institutions and community groups will be developed and implemented.

Objective 5: The community will be periodically updated regarding local efforts in mitigation planning and programming.

Objective 6: The community's public and private sector organizations will partner to promote hazard mitigation programming throughout the community.

GOAL 3: THE COMMUNITY WILL HAVE THE CAPABILITY TO INITIATE AND SUSTAIN EMERGENCY RESPONSE OPERATIONS DURING AND AFTER A DISASTER

Objective 1: Designated evacuation routes will be relocated, retrofitted, or modified to remain open before, during and after disaster.

Objective 2: Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events.

Objective 3: Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations.

Objective 4: Local emergency services facilities will be retrofitted or relocated to withstand the structural impacts of disasters.

Objective 5: Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts.

Objective 6: Shelters or structures for vehicles and equipment needed for emergency services operation will be retrofitted or relocated to withstand disaster impacts.

Objective 7: Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters.

Objective 8: Vehicle access routes to key health care facilities will be protected from blockage as a result of a disaster.

GOAL 4: THE CONTINUITY OF LOCAL GOVERNMENT OPERATIONS WILL NOT BE SIGNIFICANTLY DISRUPTED BY DISASTERS

Objective 1: Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters.

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Objective 2: Community redevelopment plans will be prepared to guide decision-making and resource allocation by local government in the aftermath of a disaster.

Objective 3: Important local government records and documents will be protected from the impacts of disasters.

Objective 4: Plans and programs will be available to assist local government employees in retrofitting or relocating their homes to ensure their availability during a disaster.

Objective 5: Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster.

Objective 6: Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster.

GOAL 5: THE THREAT OF DISASTERS TO THE HEALTH, SAFETY AND WELFARE OF THE COMMUNITY'S RESIDENTS AND VISITORS WILL BE MINIMIZED

Objective 1: Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas.

Objective 2: Effective structural measures will be developed to protect residential areas from the physical impacts of disasters.

Objective 3: Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.

Objective 4: Public and private medical and health care facilities in the community will be retrofitted or relocated to withstand the impacts of disasters.

Objective 5: Residential structures will be removed or relocated from defined hazard areas.

Objective 6: Residential structures will be retrofitted to withstand the physical impacts of disasters.

Objective 7: Safety devices on transportation networks will not fail because of a disaster.

Objective 8: Structures, facilities and systems serving visitors to the community will be prepared to meet their immediate health and safety needs.

Objective 9: There will be adequate resources, equipment and supplies to meet victims' health and safety needs after a disaster.

GOAL 6: THE POLICIES AND REGULATIONS OF LOCAL GOVERNMENT WILL SUPPORT EFFECTIVE HAZARD MITIGATION PROGRAMMING THROUGHOUT THE COMMUNITY

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Objective 1: All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters.

Objective 2: Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk.

Objective 3: Local government will ensure that hazard mitigation needs and programs are given appropriate emphasis in resource allocation and decision-making.

Objective 4: Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community.

Objective 5: Local governments will protect high hazard natural areas from new or continuing development.

Objective 6: Local jurisdictions will participate fully in the National Flood Insurance Program and the associated Community Rating System.

Objective 7: New local government facilities will be located outside of hazard areas and will be designed to not be vulnerable to the impacts of such hazards.

Objective 8: Reconstruction and rehabilitation of structures and utilities in the community will incorporate appropriate hazard mitigation techniques.

Objective 9: Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster.

GOAL 7: RESIDENTS OF THE COMMUNITY WILL HAVE HOMES, INSTITUTIONS AND PLACES OF EMPLOYMENT THAT ARE LESS VULNERABLE TO DISASTERS

Objective 1: Economic incentive programs for the general public, businesses and industry to implement structural and non-structural mitigation measures will be established.

Objective 2: Local government will support key employers in the community in the implementation of mitigation measures for their facilities and systems.

Objective 3: Programs for removal, relocation or retrofitting of vulnerable structures and utilities in hazard areas will be established and implemented.

Objective 4: The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized.

GOAL 8: THE ECONOMIC VITALITY OF THE COMMUNITY WILL BE ENHANCED BY THE MITIGATION STRATEGY, PRE- AND POST-DISASTER RECOVERY PLANNING

Objective 1: Components of the infrastructure needed by the community's businesses and industries will be protected from the impacts of disaster.

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Objective 2: Local government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community.

Objective 3: Local government will encourage community businesses and industries to make their facilities and operations disaster resistant.

Objective 4: Local government will establish programs, facilities and resources to support business resumption activities by impacted local businesses and industry.

Objective 5: Local government will implement programs to address public perceptions of community condition and functioning in the aftermath of a disaster.

Objective 6: Local government will strive to diversify the employment base of the community.

GOAL 9: THE AVAILABILITY AND FUNCTIONING OF THE COMMUNITY'S INFRASTRUCTURE WILL BE MINIMALLY DISRUPTED BY A DISASTER

Objective 1: Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities.

Objective 2: Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.

Objective 3: Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Objective 4: The telecommunications systems and facilities serving the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Objective 5: Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.

Objective 6: Water and sewer services in the community will not fail because of a disaster.

GOAL : MEMBERS OF THE COMMUNITY WILL UNDERSTAND THE HAZARDS THREATENING LOCAL AREAS AND THE TECHNIQUES TO MINIMIZE VULNERABILITY TO THOSE HAZARDS

Objective 1: All interested individuals will be encouraged to participate in hazard mitigation planning and training activities.

Objective 2: Education programs in risk communication and hazard mitigation will be established and implemented.

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Objective 3: Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the community's mitigation plan.

Objective 4: Technical training in mitigation planning and programming will be given to appropriate local government employees.

Objective 5: The owners and operators of businesses and industries in the community will be knowledgeable in appropriate hazard mitigation techniques.

Objective 6: The public living or working in defined hazard areas will be aware of that fact, understand their vulnerability and know appropriate mitigation techniques

Objective 7: The public will have facilitated access to information needed to understand their vulnerability to disasters and effective mitigation techniques

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement

44 CFR Part 201.6(c)(3)(ii):

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the local Mitigation Strategy for Volusia County, a wide range of activities were considered in order to help achieve the established mitigation goals in addition to addressing any specific and targeted hazard concerns. These activities were discussed by the LMS Working Group at meetings held over the course of plan development. In general, all activities considered by the LMS Working Group can be classified under one of the following six (6) broad categories of mitigation techniques.

1. Prevention

Preventative measures are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- ▶ Planning and zoning
- ▶ Building codes
- ▶ Open space preservation
- ▶ Floodplain regulations
- ▶ Stormwater management regulations
- ▶ Drainage system maintenance

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- ▶ Capital improvements programming
- ▶ Riverine & fault zone setbacks

2. Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- ▶ Acquisition
- ▶ Relocation
- ▶ Building elevation
- ▶ Critical facilities protection
- ▶ Retrofitting (e.g., windproofing, floodproofing, seismic design techniques, etc.)
- ▶ Safe rooms, shutters, shatter-resistant glass
- ▶ Insurance

3. Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes and sand dunes. Parks, recreation or conservation agencies and organizations often implement these protective measures. Examples include:

- ▶ Floodplain protection
- ▶ Watershed management
- ▶ Riparian buffers
- ▶ Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.)
- ▶ Erosion and sediment control
- ▶ Wetland preservation and restoration
- ▶ Habitat preservation
- ▶ Slope stabilization

4. Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- ▶ Reservoirs
- ▶ Dams & levees & dikes & floodwalls
- ▶ Diversion & detention & retention
- ▶ Channel modification
- ▶ Storm sewers

5. Emergency Services

Although not typically considered a mitigation technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

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- ▶ Warning systems
- ▶ Evacuation planning and management
- ▶ Emergency response training and exercises
- ▶ Sandbagging for flood protection
- ▶ Installing temporary shutters for wind protection

6. Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- ▶ Outreach projects
- ▶ Speaker series and demonstration events
- ▶ Hazard map information
- ▶ Real estate disclosure
- ▶ Library materials
- ▶ School children educational programs
- ▶ Hazard expositions

8.4 SELECTION OF MITIGATION TECHNIQUES FOR VOLUSIA COUNTY

In order to determine the most appropriate mitigation techniques for Volusia County, the LMS Working Group thoroughly reviewed and considered the findings of the *Capability Assessment* and *Risk Assessment*. Other considerations included each individual mitigation action's effect on overall risk to life and property, health and safety, the environment, plan consistency, its ease of implementation and general cost-effectiveness, and funding availability (if necessary).

FEMA guidance for meeting the planning requirements of the Disaster Mitigation Act of 2000 specifies that local governments should prioritize their mitigation actions based on the level of risk a hazard poses to life and property. In response to this requirement, the LMS Working Group used and completed a Mitigation Techniques Matrix (**Table 8.3**) to make certain they addressed, at a minimum, those hazards posing the greatest threat.

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TABLE 8.3: Mitigation Techniques Matrix for Volusia County

MITIGATION TECHNIQUE	HIGH RISK HAZARDS			
	FLOOD	HURRICANE AND TROPICAL STORM	STORM SURGE	TORNADO
Prevention	✓	✓	✓	✓
Property Protection	✓	✓	✓	✓
Natural Resource Protection	✓	✓	✓	
Structural Projects	✓	✓	✓	✓
Emergency Services	✓	✓	✓	✓
Public Education & Awareness	✓	✓	✓	✓

The Mitigation Techniques Matrix provides the LMS Working Group with the opportunity to cross-reference each of the priority high risk hazards (as determined by through the *Risk Assessment*) with the aforementioned comprehensive range available mitigation techniques, including prevention; property protection; natural resource protection; structural projects; emergency services; and public education and awareness. However, it is important to note that Volusia County's Mitigation Action Plan includes an array of actions targeting multiple hazards, and is not necessarily limited to only those classified as high risk.

8.5 MITIGATION SUCCESS STORIES

Completed mitigation projects in any community represent a proactive approach to reducing vulnerability. It can often be difficult to convince a community to use funds for an imminent disaster when no danger is present and local, state, and federal funding sources pose a competitive application process. However, the payoff for these proactive actions can be immense. Mitigation helps to avert loss of life and injury, reduce damage to public and private property, lessen expenditure of resources and exposure to risk for first responders, reduce costs of disaster response and recovery, accelerate recovery of communities and businesses affected by disasters, and enhance community resiliency¹. Many of the

tional Emergency Management Association (NEMA)

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jurisdictions in Volusia County have completed mitigation projects that reduced vulnerability. A total of 50 facility hardening projects, 22 flood protection projects, 20 storm water and drainage projects and 22 generator projects have been completed as part of this process (a total of 114 projects). Other specific mitigation project and initiative examples are profiled below, by jurisdiction.

Daytona Beach

The City of Daytona Beach City Hall is a critical facility that houses many of the City's emergency response personnel. It is a central point of information for its residents and a place where many critical decisions are made. The City received HMGP funds after the 2004 hurricanes and those grant funds were used to install hurricane resistant impact glass through the entire facility. This critical facility would need to be evacuated for minor hurricanes and the contents now have protection against wind events.

The City used HMGP funds from the 2004 hurricanes to retrofit all the doors and windows at the Public Works complex which is also a critical facility. This facility was hardened and upgraded with impact glass and hurricane rated doors. This facility is the main location for the Public Works response personnel handling road repairs, signs, vehicle maintenance, debris removal, garbage pick up, etc.

DeBary

West Side Emergency Flood Management System (\$22.5 million project cost): After the 2004 hurricanes (Charley, Frances and Jeanne) caused massive structural flooding throughout the City primarily due to overtopping of landlocked lakes, the City of DeBary's West Side Emergency Flood Management System project was implemented in an effort to further reduce the hydraulic load on the existing central and east side flood control systems. With \$52 federal funding provided by FEMA via the Hazard Mitigation Grant Program, combined with additional funding provided by FDOT and the City of DeBary, construction of the first 6 phases of the west side system was completed in 2010, including permanent pump stations installed at Lake Susan, the DeBary Golf and Country Club (DGCC) entrance pond and Quail Lake, with approximately 0.6 miles of 12-inch diameter force main installed between Lake Susan and the DGCC entrance pond and approximately 4.6 miles of 26-inch diameter force main installed between the DGCC entrance pond and the City's Regional Stormwater Storage Facility (RSSF). A former borrow pit located immediately east of Bonomac Lake and the railroad was acquired to serve as the City's RSSF and accept the discharge from the west side system service area that encompasses approximately 1,151 acres.

Lakeside Gravity Outfall System (\$650K project cost): After receiving over 20-inches of rainfall during Tropical Storm Fay in August 2004, seventeen (17) mobile homes, a community center, and twenty-two (22) duplex homes experienced significant flooding which impacted a total of 61 homeowners. With FEMA assistance via the Hazard Mitigation Grant Program, several overflow systems were constructed to serve the Lakeside community within the DeBary Golf and Country Club, Kings Lake, Kings Lake wetland and within the Terra Alta manufactured home community. This project included construction of an emergency pump connection, stormwater force main, concrete overflow weirs, drainage inlets, storm pipes, flow control devices (sluice gates), and a groundwater seepage control system (drainage inlets, underdrain pipe and rock media) as well as the modification of existing water control structures, as necessary. Stormwater runoff from this project was designed to discharge into an existing stormwater pond where the West Side Emergency Flood Management System will ultimately pump the water to the City's Regional Stormwater Storage Facility.

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9-Home Buy-Out Project (\$2.1 million project cost): After Tropical Storm Fay down poured over 20-inches of rainfall in southwest Volusia County in August 2008, nine (9) structures within the City of DeBary that had experienced significant structural flooding were targeted for acquisition and demolition. The City of DeBary was able to implement this project with FEMA's financial assistance via the Flood Mitigation Assistance grant program. Parcels where flood-impacted home structures once existed were converted into open space and will remain in that state in perpetuity.

Pine Valley Court Home Buy-Out Project (\$250K project cost): This property experienced considerable structural flooding after severe storm events that prompted the City of DeBary to purchase the affected property in 2009 and demolish it soon thereafter while keeping the parcel as open space in perpetuity. This project was possible due to FEMA's financial contribution via the Flood Mitigation Assistance Program.

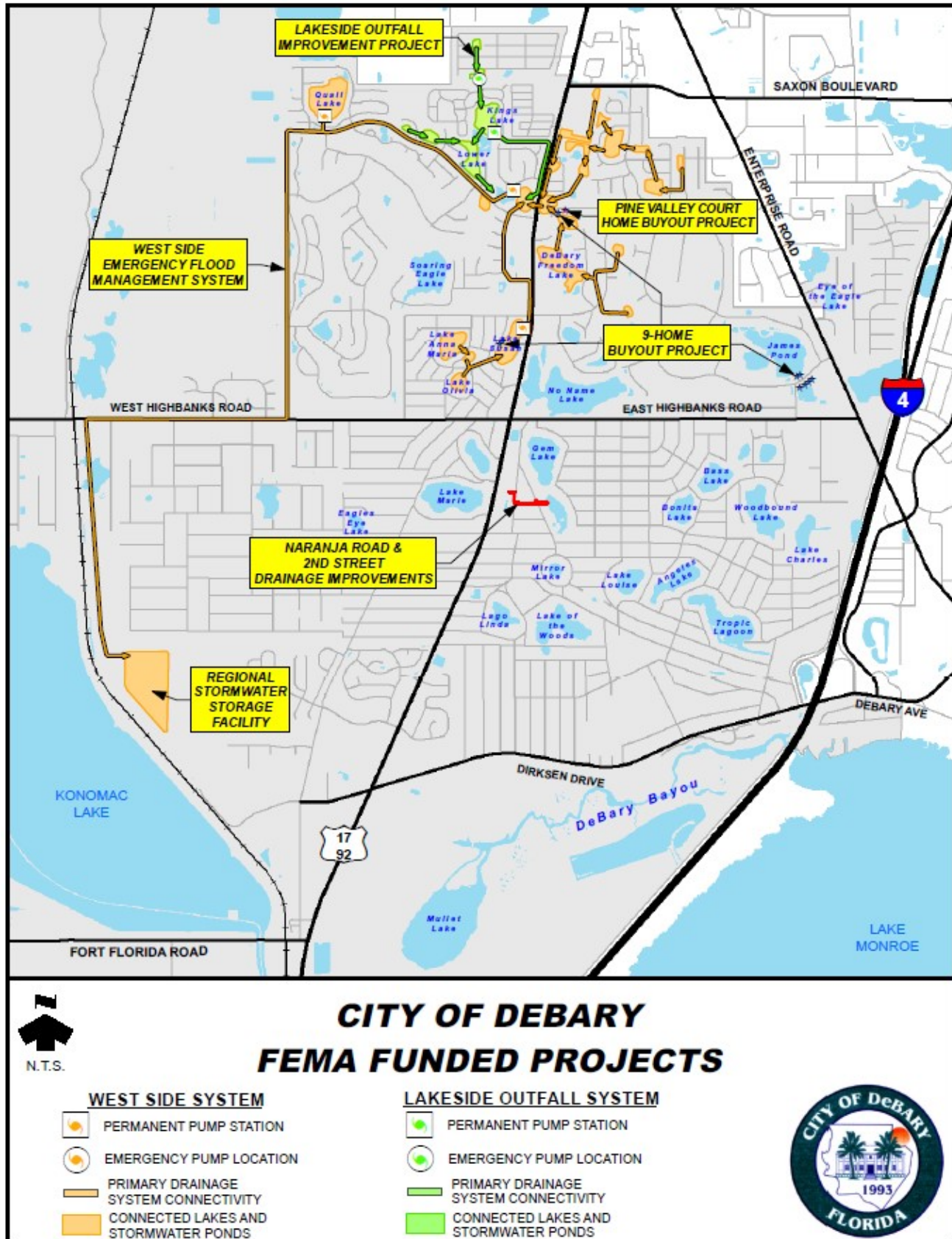
Naranja Road and 2nd Street Drainage Improvements (\$225K project cost): The 2004 hurricanes (Charley, Frances and Jeanne), Tropical Storm Fay in August 2008 and the Gulf Gale storm in May 2009 caused significant flooding in the vicinity of Naranja Road, 2nd Street and Alicante Road. The homes located at 46 and 48 Naranja Road experienced substantial flood damage, and the structure foundation and concrete slab of the home at 49 Alicante Road experienced substantial erosion and undermining as well as the rear deck of 53 Alicante Road. FEMA funding was secured via a Hazard Mitigation Grant Program grant application for the construction of a new drainage system including an overflow structure for the depressional area near 46 and 48 Naranja Road connected to storm pipes and structures along Naranja Road, 2nd Street and Alicante Road. The system was designed to discharge to Half Moon Lake in the vicinity of 49 and 53 Alicante Road. DeBary's mitigation projects are pictured on the next page of this report.

Regional Success Stories

Jurisdictions in Volusia County took part in a number of cross-jurisdictional projects that aimed to improve resiliency in the County. One example is the East Central Florida Resiliency Action Plan, which was developed by the East Central Florida Regional Planning Council with direction and collaboration from all jurisdictions in Volusia and Brevard counties. This plan developed best practices for hazard mitigation (including maintenance of the Mitigation Plan), provided clear data to cities on multiple hazards, such as sea level rise, and developed mock timeframes for cities to potentially follow in order to improve their mitigation efforts and overall resiliency. DeLand, Deltona, Orange City, New Smyrna Beach, the River to Sea TPO, Oak Hill and Lake Helen have adopted this plan. Following the adoption of the Regional Resiliency Action Plan, the East Central Florida Regional Resiliency Collaborative was established to increase resiliency and sustainability in the east central Florida Region. The cities of DeLand, Deltona, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach and Ponce Inlet have become partners of the collaborative.

Finally, in 2019 and 2020, all jurisdictions in the county took part in a project with the Florida Department of Environmental Protection and the East Central Florida Regional Planning Council to assess risk to critical facilities and projects included in the Mitigation Plan to sea level rise, storm surge, and the combined effects of storm surge and sea level rise. On February 7th, 2020, from 1:00 PM to 4:30 PM, all cities in the county got together for a workshop to view their mitigation projects and critical facilities alongside these hazard zones. Vulnerabilities were discussed, as was the LMS priority project ranking system. A full plan will be completed in April with input from cities incorporated.

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Edgewater

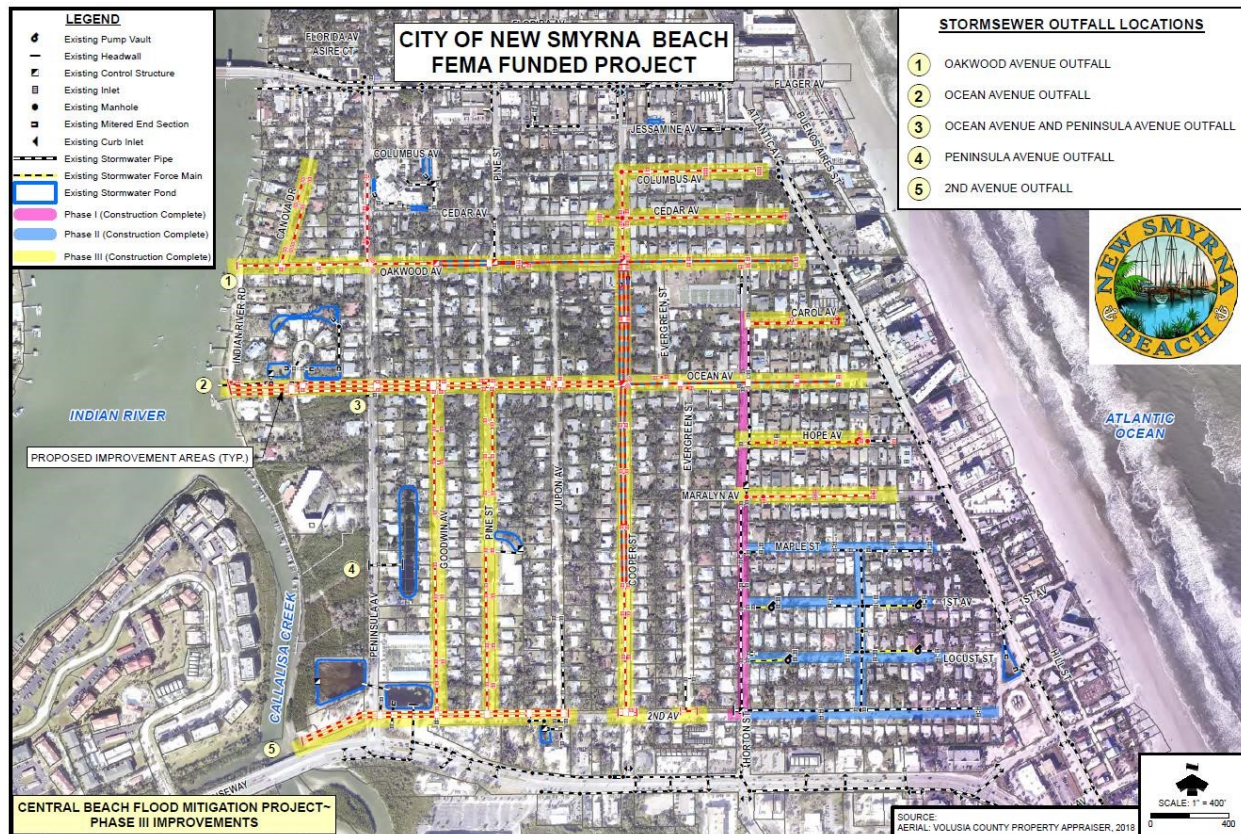
The City of Edgewater has demonstrated a proactive operation by embarking on mitigation projects using city and grant funds to prevent further damage or loss of public and private properties.

- ▶ The City purchased a repetitive loss home on West Pine Bluff, demolished it and constructed a retention pond to eliminate flooding in the neighborhood.
- ▶ City owned facilities were improved to be more storm resistant using city and grant funds.
- ▶ Stormwater pipe was lined in the Wildwood Subdivision to prevent the continual flooding using city funds.
- ▶ The Environmental Services Department Stormwater Division provides continual maintenance to all canals, swales, and retention points to eliminate problems with the stormwater system throughout the city.
- ▶ Seagrass was planted along the riverbank at Kennedy Park to eliminate erosion of shoreline.

New Smyrna Beach

Central Beach Flood Mitigation Improvements (\$5.0 million project cost): During November of 2001, the Central Beach area experienced significant structural and roadway flooding due to several factors ranging from approximately 9.5-inches of rainfall and high tides to reduction in flood storage and increased impervious area due to in-fill development over the years. Phases I and II were constructed by 2004 and in 2005 the City implemented Phase III with financial assistance from FEMA via the Flood Mitigation Assistance Program. Specifically, the proposed Phase III stormwater conveyance improvements included upgrades to the existing stormwater management systems and construction of new storm sewer systems to provide adequate flood protection for the residences within the Central Beach 206-acre watershed. The improvements are located within the rights-of-way of the following twelve (12) roads: Columbus Avenue, Cedar Avenue, Oakwood Avenue, Carol Avenue, Ocean Avenue, Hope Avenue, Maralyn Avenue, Canova Drive, Goodwin Avenue, South Pine Street, Cooper Street, and 2nd Avenue. In addition to the conveyance system upgrades (storm sewer pipes, drainage inlets, and pumps), exfiltration systems were implemented within segments of the Cooper Street, Oakwood Avenue and Ocean Avenue rights-of-way in order to provide a water quality benefit to the Indian River.

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Since the implementation and completion of this multi-faceted project, no homeowners have reported flooding to their properties in the Laurel Creek Basin mitigated area

Ormond Beach

During the period of May 17-24, 2009, the City of Ormond Beach experienced a storm event that resulted in many areas of the City receiving approximately 27 inches of rainfall. There was significant flooding of homes and streets primarily in the Laurel Creek drainage basin area. In June 2009, the City Commission authorized a stormwater study to be performed by its stormwater consultant to determine what improvements could be made to prevent future flooding incidences from occurring. The Study recommended a two-phase approach and the City using primarily HMGP funding completed: Phase 1: the interconnection of the Central Park lakes 1-5 to Laurel Creek, reconstruction of Hand Avenue, installation of a new drainage system to reduce flooding frequency; and Phase 2: implementation of a system to drawdown more rapidly during extreme events using a pump station with an associated treatment pond and force main to the Halifax River. Also, Continuous Monitoring and Adaptive Control (CMAC) Technology was installed to control the lake levels.

South Daytona

After Tropical Storm Gordon, the City of South Daytona set an aggressive course to eliminate the flooding of homes. To achieve this, South Daytona increased stormwater utility fees to fund many of the needed improvements to protect residents and their homes and made major changes to the building standards. While the system is not perfect, the number of homes with storm water damage in the most recent storm dropped from 300 homes during Gordon to 16. This reflects an 80 percent reduction in homes flooded.

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8.6 PLAN UPDATE REQUIREMENT

Because of FEMA requirements for plan updates, the Mitigation Action Plan was reviewed by each agency responsible identified for implementing the action. For each action, an update on the implementation status (completed, deleted, or deferred) was provided and milestones achieved or impediments to implementation of the actions were identified. These updates have been provided in Section 9: *Mitigation Action Plan*.

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44 CFR Requirement

44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

This section includes the listing of the mitigation actions proposed by Volusia County and its participating jurisdictions and partners. It has been designed to achieve the mitigation goals and objectives established in Section 8: Mitigation Strategy, and will be maintained on a regular basis according to the plan maintenance procedures established in Section 10: Plan Maintenance Procedures.

As described in the previous section, the Mitigation Action Plan, or MAP, represents an unambiguous and functional plan for action. Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard vulnerability for Volusia County.

Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for implementing the action. Specific information regarding project cost and timeframe for its completion are on file with Volusia County Emergency Management. These implementation mechanisms ensure that Volusia County Local Mitigation Strategy remains a functional document that can be monitored for progress over time.

The LMS “Volusia Prepares” working group did not alter the priority ranking system since the 2015 plan update. Future consideration will be given to the potential impacts of sea level rise and storm surge, but those amendments have not been finalized. Initial conversation on updating the priority ranking system occurred on February 9th, 2020 at the FDEP Volusia County Project Meeting (previously referred to in this report).

Table 9.1 describes the key elements of the Mitigation Action Plan.

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Table 9.1: Key Elements of the Mitigation Action Plan

Priority	Indicates whether the action is a “low” priority, “moderate” priority or “high” priority based on the established prioritization criteria: Low = <10; Moderate = 11-24; High = 25+
Jurisdiction	Identifies the geographic location where the initiative is located.
Responsible Organization	Identifies the local agency, department or organization that is best suited to implement the proposed action, project or initiative.
Hazard(s)	Lists the hazard(s) the proposed action is designed to mitigate against.
Mitigation Technique Category	Indicates the mitigation technique that the proposed action is designed to help achieve. Categories include: E = Emergency Services; P = Prevention; PE = Public Education; PP = Property Protection; S = Structural
Initiative	Identifies a specific action that, if accomplished, will reduce vulnerability and risk in the impact area. Actions may be in the form of local policies (i.e., regulatory or incentive-based measures), programs or structural mitigation projects and should be consistent with any pre-identified mitigation goals and objectives. An identification number is provided. The county has additional information on file for each initiative (e.g., location, damage history, specific mitigation measure, estimated cost, etc.)
Funding	If applicable, indicates how the cost to complete the action will be funded. For example, funds may be provided from existing operating budgets or general funds, a previously established contingency fund, a cost-sharing federal or state grant program, etc. The default funding source for initiatives within this listing is the Hazard Mitigation Grant Program (HMGP). Outside of the HMGP, funding sources for these projects are typically determined on the local level for “proactive” projects that do not need a disaster declaration to be funded. However, most of the projects on this listing do not have a set funding source, which defaults the project to HMGP. If identified, specific funding sources will be attributed to initiatives.
Approved by LMS Working Group	Identifies the date when the initiative was approved by the LMS Working Group
Completion Date	Indicates when the action was completed. Remember that some actions will require only a minimal amount of time, while others may require a long-term or continuous effort. Projects are “deferred” or “terminated” from list listing at the discretion of the jurisdiction that is implementing those changes. When initiatives are deferred or deleted on the jurisdictional level, countywide representatives are notified via the LMS Working Group (or Volusia Prepares) and the countywide initiative listing is updated at that time.
Status	The status indicators for each initiative is as follows: • C = Completed • D = Deferred ***See notes under “Completion Date” above*** • N = New • T = Terminated ***See notes under “Completion Date” above*** • U = Updated • A = Active/Open

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Each mitigation initiative has been scored by the responsible jurisdiction. The scoring system is included in Section 8: Mitigation Strategy (Table 8.1).

Prioritizing the proposed mitigation actions was based on the following 11 factors:

- ▶ Population Benefited
- ▶ Health and Safety Considerations
- ▶ Environmental Impact
- ▶ Consistency with Other Plans and Programs
- ▶ Reduces Risk of Future Property Damage
- ▶ Supports Essential or Critical Services
- ▶ Probability of Receiving Funding for Implementation
- ▶ Feasibility of Implementation
- ▶ Community Rating System
- ▶ Repetitive Loss Mitigation
- ▶ Benefit Cost Ratio (to be conducted prior to submitting a project for grant consideration)

Each mitigation initiative was scored on 10 of these 11 factors. The jurisdictions have not run an official benefit cost analysis (BCA) for the initiatives at this time. The jurisdictions did include a general BCA in the mitigation initiative application that was submitted to Volusia County Emergency Management. However, the BCA will be run for the initiatives following a disaster to factor in all known damage costs.

The mitigation initiatives are not listed in exact priority order, though each has been assigned a priority level of “low”, “moderate”, or “high”. Once the BCA is run, a numerical priority will be assigned.

All mitigation initiatives included in the Action Plan that propose to reduce flood hazard vulnerability advance the intent of the National Flood Insurance Program (NFIP), as they will meet the current local floodplain regulations adopted by the jurisdictions as required by the NFIP. Two of the scoring factors used to determine the priority of the actions specifically address the intent of the NFIP and the Community Rating System (CRS). These two factors consider whether the initiative supports elements of the CRS and reduces repetitive flood losses.

Volusia County is highly committed to reducing flood losses in support of the NFIP, and has predominantly used local funding to implement these projects. Examples of these initiatives include: acquiring and relocating repetitive loss structures, relocating critical facilities from the 100-year floodplain, floodproofing equipment at water treatment plants, performing drainage improvement projects and creating new topographic maps based on newly collected Light Detection and Ranging (LiDAR) data. Approximately half of open disaster mitigation initiatives half support flood hazard vulnerability reduction.

The open mitigation initiatives are listed in the Action Plan in **Table 9.2**. If a mitigation initiative does not have a status indicator, it is considered “open”. A live listing of mitigation projects can be found via the online link in Appendix F.

In 2019, the East Central Florida Regional Planning Council and Volusia County Emergency Management mapped the locations of all mitigation projects, by type, as part of a project with the Florida Department of Environmental Protection. These maps are available upon request.

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Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)Status: *C = Current*Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	Ormond Beach	City Engineer	Flood	S	VOL-0452 Flooding control pump on Fleming Ave., which will discharge into the Halifax River.	HMGP	3/30/2015	1/1/2016	C
	South Daytona	Community Development	Flood	P	VOL-0453 Purchase a vacant parcel of land and install a stormwater retention pond to help recent flooding.	HMGP	10/13/2015	1/1/2016	C
	Holly Hill	Public Works	Multi	PP	VOL-0457 Hurricane Shutters and City Hall Annex	HMGP	9/11/2013	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0460 Exmore Avenue Stormwater Improvements	HMGP FMA	6/13/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0461 Lamplighter Section Line Stormwater Improvements	HMGP FMA	6/14/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0463 Montebello Avenue Stormwater Improvements	HMGP FMA	6/16/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0464 Picasso Avenue Stormwater Improvements	HMGP FMA	6/17/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0465 Tune Avenue Stormwater Improvements	HMGP FMA	6/18/2014	1/1/2016	C
	Deltona	Public Works	Flood		VOL-0466 Zinnia Avenue Stormwater Improvements	HMGP FMA	6/19/2014	1/1/2016	C

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	
	New Smyrna Beach	Fire	Flood		VOL-0467 Isleboro subdivision storm water management	HMGP	3/11/2015	1/1/2016	C
	Ormond Beach	Engineering	Flood	P	VOL-0468 772 N Beach St convert property into a stormwater storage site to aid in the prevention of flooding.	FMA	8/14/2015	1/1/2016	C
	South Daytona	Public Works	Flood	P	VOL-0469 Construction of stormwater management system adjacent to City Hall. This will help emergency vehicles have more access to the road during minor storm events.	HMGP	8/14/2015	1/1/2016	C
33	Ormond Beach	Public Works	Flood	PP P	VOL-0472 Wilmette Avenue Stormwater Pump Station - install permanent pump station Laurel Creek	HMGP	12/14/2016	Jan-21	C
33	Ormond Beach	Public Works	All Hazard	PP ES	VOL-0473 Ormond Beach Lift Station backup - purchase 4 pumps	HMGP	12/14/2016	Jan-21	C
21	Holly Hill	Public Works	Flood	PP	VOL-0474 Cordova Drainage Basin Improvements Phase I	HMGP	12/14/2016	Jan-21	C
40	FL Hospital	EM Coordinator	All Hazard	PP ES	VOL-0475 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Memorial Medical Center	HMGP	12/14/2016	Jan-21	C
40	FL Hospital	EM Coordinator	All Hazard	ES	VOL-0476 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Oceanside	HMGP	12/14/2016	Jan-21	C

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
23	FL Hospital NSB	EM Coordinator	Wind	P PP S ES	VOL-0477 The entire hospital roof replacement to bring it up to Miami Dade Wind Code	HMGP	12/14/2016	Jan-21	C
23	FL Hospital NSB	EM Coordinator	Wind	P PP S ES	VOL-0478 Building sealing and wet glazing windows (GP_2) to mitigate the loss of any future hospital services and bring facility to Miami Dade Code	HMGP	12/14/2016	Jan-21	C
23	FL Hospital NSB	EM Coordinator	Wind	P PP S ES	VOL-0479 Electrical infrastructure for Chiller and Life Safety redundancy	HMGP	12/14/2016	Jan-21	C
38	Port Orange	Public Works	Flood	P PP S	VOL-0480 White Place and Riverside Drive drainage improvements	HMGP	12/14/2016	Jan-21	C
32	Port Orange	Public Works	Flood	P PP S	VOL-0481 Tumblebrook Drive (Sweetwater Hills) stormwater improvements (201409)	HMGP	12/14/2016	Jan-21	C
34	Port Orange	Public Works	Flood	P PP S	VOL-0482 Southwinds Stormwater Pond Outfall Retrofit (201441)	HMGP	12/14/2016	Jan-21	C
38	Port Orange	Public Works	Flood	P PP S	VOL-0483 Pipe replacement (201647) replace pipe with reinforced concrete pipe to improve stormwater conveyance to reduce potential for flooding	HMGP	12/14/2016	Jan-21	C
39	Port Orange	Public Works	Flood	P PP S	VOL-0484 Storm drain pipe lining (180202)	HMGP	12/14/2016	Jan-21	C

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	
24	Edgewater	Public Works	Flood Surge Wind	P PP S NS	VOL-485 - Generators for City of Edgewater lift stations (4)	HMGP	12/14/2016	Jan-21	C
23	Edgewater	Public Works	All Hazard	NS ES	VOL-0486 Portable Generators - Traffic Signals (7)	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	All Hazard	NS ES	VOL-0487 - Edgewater Code House generator	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0488 Impact windows for YMCA facility - critical facility for shelter	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0489 - Impact windows for City of Edgewater Wastewater Administration Building	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0490 - Impact windows for City of Edgewater Parks & Recreation Office Building	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0491 - Impact windows City of Edgewater Fire Station #57	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0492 Impact windows for City of Edgewater Fire Hall - houses emergency personnel during a disaster event	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0493 Impact windows Code House - houses emergency personnel during a disaster event	HMGP	12/14/2016	Jan-21	C

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
22	Edgewater	Public Works	Wind	PP	VOL-0494-Revised Harden Edgewater Wasterwater Treatment Plant 500 W. Ocean Avenue, Edgewater with safe harbor room	HMGP	12/14/2016	Jan-21	C
22	Edgewater	Public Works	Wind	PP	VOL-0495 Harden Edgewater Wasterwater Treatment Plant/EOC, 3315 SR 442, Edgewater with safe harbor room	HMGP	12/14/2016	Jan-21	C
21	Edgewater	Public Works	All Hazard	NS ES	VOL-0496 - Edgewater City Hall generator - purchase & installation	HMGP	12/14/2016	Jan-21	C
21	Edgewater	Public Works	All Hazard	NS ES	VOL-0497 - Water Treatment Plant/EOC Generator replacement	HMGP	12/14/2016	Jan-21	C
20	Edgewater	Public Works	Flood	P PP S NS	VOL-0498 - Acquire & demolish repetitive flood loss home at 405 Hart Avenue	HMGP FMA	12/14/2016	Jan-21	C
20	Edgewater	Public Works	Flood Surge Wind	P PP S	VOL-0499 - Menard May Park Erosion Project shoreline stabilization. Timber pier replacement, fishing pier lighting, & upland retaining wall.	HMGP	12/14/2016	Jan-21	C
33	Halifax Health	Halifax Health	All Hazard	P PP S NS ES	VOL-0500 - Data Center hardening @ Daytona Beach campus	HMGP	1/25/2017	Jan-21	C
34	Halifax Health	Halifax Health	All Hazard	P PP NS ES	VOL-0502 Replacement of 3 (1960 Diesel) Emergency power generators and transfer switches	HMGP	1/25/2017	Jan-21	C
34	Halifax Health	Halifax Health	All Hazard	P PP NS ES	VOL-0503 Emergency power for HVAC equipment at Port Orange Hospital facility	HMGP	1/25/2017	Jan-21	C

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
21	Lake Helen	Lake Helen	All Hazard	PP NS	VOL-0504 City of Lake Helen Virginia Drive Sub-base stabilization and repaving.	HMGP	1/25/2017	Jan-21	C
24	Lake Helen	Lake Helen	Flood	NS	VOL-0505 City of Lake Helen Ohio stormwater culvert	HMGP	1/25/2017	Jan-21	C
27	Lake Helen	Lake Helen	Flood Wind	PP	VOL-0506 City of Lake Helen Police Dept/EOC flood and wind prevention by sealing for water and protecting doors & windows	HMGP	1/25/2017	Jan-21	C
33	Holly Hill	Holly Hill	Flood Surge	PP S	VOL-0507 Drainage improvements - installation of 29 duckbill valves along outfalls to Halifax River	HMGP	1/25/2017	Jan-21	C
31	Holly Hill	Holly Hill	Flood Surge	PP	VOL-0508 - Shutters for City Hall	HMGP	1/25/2017	Jan-21	C
34	Ormond Beach	Ormond Beach	All Hazard	ES	VOL-0509 Ormond Beach Emergency Operations Center - build Community Center that will be used as EOC in disaster	HMGP	1/25/2017	Jan-21	C
28	DeLand	DeLand	All Hazard	PP NS ES	VOL-0510 Standby generator power for Sanborn Center which is used for meal prep for 1st responders in disaster	HMGP	1/25/2017	Jan-21	C
33	South Daytona	South Daytona	All Hazard	ES	VOL-0511 permanent generator for the Piggotte Center - critical facility during disasters	HMGP	2/6/2017	Jan-21	C
38	Ormond Beach	Ormond Beach	Flood	P PP NS	VOL-0512 Fleming Avenue Stormwater improvements	HMGP	2/6/2017	Jan-21	C

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Status: C = Current

Category: P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
34	Holly Hill	Holly Hill	Wind	ES	VOL-0513 Hurricane rated bay doors at the Fire Station (4 bay doors)	HMGP	2/6/2017	Jan-21	C
32	Volusia County	Public Works	Flood	P PP S	VOL-0514 Rio Way Regional Retention Pond	HMGP	2/6/2017	Jan-21	C
35	Port Orange	Public Works	All Hazard	ES	VOL-0515 Backup generators for Fire Stations 71 and Fire Station 73	HMGP	2/6/2017	Jan-21	C
28	School Board	School Board	All Hazard	NS ES PE	VOL-0516 Provide emergency generators for 9 shelter locations	HMGP	2/6/2017	Jan-21	C
28	School Board	School Board	All Hazard	NS ES PE	VOL-0517 Upgrade 6 shelter locations - provide emergency generator connections and air quality improvements	HMGP	2/6/2017	Jan-21	C
28	School Board	School Board	All Hazard	NS ES PE	VOL-0518 Upgrade 3 shelter locations - provide emergency generators connections and air quality improvements	HMGP	2/6/2017	Jan-21	C
38	Port Orange	Public Works	Flood	P S PP	VOL-0519 Virginia and Monroe Street Drainage Improvement	HMGP	5/26/2017	Jan-21	C
20	Lake Helen	Lake Helen	Flood, Wind	ES	VOL-0520 City of Lake Helen Pre-Disaster Mitigation Proposal	HMGP	9/26/2017	Jan-21	C
39	Ormond Beach	Ormond Beach	Flood	P PP NS	VOL-0521 Woodrige Drive Drainage Improvements	HMGP	12/13/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: C = Current

Category: P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0522 1048 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0523 1013 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0524 988 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0525 356 Seminole Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0526 Cherokee Road Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0527190 Flamingo Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0528 241 Cherokee Road Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
28	Volusia County	Emergency Management (VC)	All Hazard	P PP S	VOL-0529 1052 Shockney Drive Elevation & Retrofit	HMGP	12/13/2017	Jan-21	C
29	Holly Hill	Public Works	Flood	P	VOL-0530 Drainage Improvements South Espanola Avenue	HMGP	12/13/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)Status: *C = Current*Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	
25	Deltona	City of Deltona	All Hazard	PP S ES	VOL-0531 Hardening Critical Facilities in Deltona: Station 64	Retrofi t Public/ Histori c Struct ures	12/13/2017	Jan-21	C
25	Deltona	City of Deltona	All Hazard	PP S ES	VOL-0532 Hardening Critical Facilities in Deltona: Deltona Water	Retrofi t Public/ Histori c Struct ures	12/13/2017	Jan-21	C
25	Deltona	City of Deltona	All Hazard	PP S ES	VOL-0533 Hardening Critical Facilities in Deltona: Public Works	Retrofi t Public/ Histori c Struct ures	12/13/2017	Jan-21	C
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0534 Hardening of Hospice Critical Care Site at Port Orange Beach Care Center 2nd Floor	HMGP	12/13/2017	Jan-21	C
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0535 Hardening of Hospice Critical Care Site at Ormond Beach Care Center	HMGP	12/13/2017	Jan-21	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: C = Current

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Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0536 Hardening of Hospice Critical Care Site at Southeast Volusia Care Center	HMGP	12/13/2017	Jan-21	C
37	Halifax Health	Halifax Health	Flood Surge Wind	P PP	VOL-0537 Hardening of Hospice Critical Care Site at West Volusia Care Center	HMGP	12/13/2017	Jan-21	C
24	Deltona	City of Deltona	Wind	P PP ES	VOL-0538 Retrofit roof of City Hall	HMGP	12/13/2017	Jan-21	C
26	Holly Hill	City of Holly Hill	Wind	P PP ES	VOL-0539 Hardening of Sica Hall Community Center- Special needs post disaster shelter	HMGP	12/13/2017	Jan-23	C
28	Ormond Beach	City of Ormond Beach	Flood	P PP S	VOL-0540 Elevate and retrofit flood damaged home- 520 W St. Ormond Beach, FL	HMGP	12/13/2017	Jan-23	C
32	Port Orange	City of Port Orange	Flood	P PP NS	VOL-0541 Howes Street drainage improvements	HMGP	4/16/2018	Jan-23	C
24	Edgewater	City of Edgewater	Flood Surge Wind	P PP S ES	VOL-0542 Improvement #1 to 50 lift stations in Edgewater	HMGP	4/16/2018	Jan-23	C
24	Edgewater	City of Edgewater	Flood Surge Wind	P PP S ES	VOL-0543 Improvement #2 to 50 lift stations in Edgewater	HMGP	4/16/2018	Jan-23	C
24	Edgewater	City of Edgewater	Flood Surge Wind	P PP S ES	VOL-0544 Improvement #3 to 50 lift stations in Edgewater	HMGP	4/16/2018	Jan-23	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: C = Current

Category: P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
29	Holly Hill	City of Holly Hill	Surge	P ES NS	VOL-0545 Generator for Sica Hall	HMGP	4/16/2018	Jan-23	C
34	Ormond Beach	City of Ormond Beach	Flood	P PP ES	VOL-0546 Strickland Creek flood protection	HMGP	4/16/2018	Jan-23	C
31	Ormond Beach	City of Ormond Beach	Flood	P PP	VOL-0547 Drainage improvements	HMGP	4/16/2018	Jan-23	C
33	Ormond Beach	City of Ormond Beach	Wind	P PP ES PE	VOL-0548 Hardening Critical Facilities in Ormond Beach: City Hall, Police Dept, Fleet Ops, Public Works, and Art Center	HMGP	4/16/2018	Jan-23	C
28	New Smyrna Beach	City of New Smyrna Beach	Flood	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	4/16/2018	Jan-23	C
28	New Smyrna Beach	City of New Smyrna Beach	Flood	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	4/16/2018	Jan-23	C
28	New Smyrna Beach	City of New Smyrna Beach	Flood	P PP S	VOL-0551 Acquisition and Demolition of Flood Prone Homes	HMGP	4/16/2018	Jan-23	C
26	South Daytona	City of South Daytona	Flood	P PP S	VOL-0552 Elevation of flood- prone home	HMGP	4/16/2018	Jan-23	C
	Holly Hill	City of Holly Hill	Flood	P PP S ES	VOL- 0553 Lift Station #9 Refurbishment	HMGP	6/20/2018	Jan-23	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Status: C = Current

Category: P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	
	Holly Hill	City of Holly Hill	Flood	P PP S ES	VOL-0554 Lift Station # 19 Refurbishment	HMGP	6/20/2018	Jan-23	C
	Holly Hill	City of Holly Hill	Flood	P PP S ES	VOL-0555 Lift Station #21 Refurbishment	HMGP	6/20/2018	Jan-23	C
	Ormond Beach	City of Ormond Beach	Flood	P PP S	VOL-0556 Elevation of Flood-prone home	HMGP	6/20/2018	Jan-23	C
	FL Hospital MMC	Florida Hospital Memorial Medical Center	All Hazard	P PP S ES	VOL-0557 Emergency Power Upgrade	HMGP	9/12/2018	Jan-23	C
	Ormond Beach	City of Ormond Beach	Flood Surge	P PP S	VOL-0558 Acquire and Demolish Flood-prone home	FMA	9/12/2018	Jan-23	C
	FL Hospital DeLand	Florida Hospital DeLand	All Hazard	P PP S	VOL-559 Roof Repair and Strengthen	HMGP	9/12/2018	Jan-23	C
	Volusia County	VCEM	Riverine Surge	P PP S	VOL-0560 Elevate and retrofit flood prone home	FMA	10/3/2019	Jan-24	C
	Volusia County	VCEM	Riverine Surge	P PP S	VOL-0561 Elevate and retrofit flood prone home	FMA	10/3/2019	Jan-24	C
	FL Hospital DeLand	Florida Hospital DeLand	All Hazard	P PP S	VOL-0562 Upgrade Windows	HMGP	9/12/2018	Jan-23	C

SECTION 9: MITIGATION ACTION PLAN

Table 9.2: Mitigation Action Plan: Open Mitigation Initiatives by Jurisdiction (as of 10/21/2019)Status: *C = Current*Category: *P = Prevention; PP = Property Protection; S = Structural; ES = Emergency Services; PE = Education*

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	
	Holly Hill	The City of Holly Hill	Flood	P PP S	VOL-563 Elevation of home at 318 Riverside Dr.	HMGP	9/12/2018	Jan-23	C
	DeLand	City of DeLand	All Hazard	P PP S	VOL- 564 Generator Power for sheltering	HMGP	3/20/2019	Jan-24	C
	Volusia County	VCEM	Flood	P PP S	VOL- 0565 Elevate and Retrofit home at 1036 Shockney Dr Ormond Beach	FMA	10/3/2019	Jan-24	C
	Volusia County	VCEM	Flood	P PP S	VOL- 0566 Elevate and Retrofit home at 6411 River Road New Smyrna Beach	FMA	10/3/2019	Jan-24	C
	Volusia County	VCEM	Flood	P PP S	VOL- 0567 Elevate and Retrofit home at 364 Seminole Dr Ormond Beach	FMA	10/3/2019	Jan-24	C

SECTION 9: MITIGATION ACTION PLAN

Completed, Deleted and Deferred Projects Since the 2015 Update

The following mitigation projects were completed, deleted or deferred since the 2015 LMS update:

Table 9.3: Mitigation Action Plan: Completed, Deleted and Deferred Mitigation Initiatives by Jurisdiction (as of 10/21/2019)

Priority	Jurisdiction	Responsible Organization	Hazard(s)	Mitigation Technique Category	Initiative	Funding	Approved by LMS Working Group	Original Anticipated Completion	Status
	Deltona	Public Works	Flood		VOL-0458 Blackburn Avenue and Eldridge Street stormwater improvements	HMGP FMA	6/11/2014	1/1/2016	Completed
	Deltona	Public Works	Flood		VOL-0459 Brickell Drive stormwater improvements	HMGP FMA	6/12/2014	1/1/2016	Completed
	Deltona	Public Works	Flood		VOL-0462 Leland Drive stormwater improvements	HMGP FMA	6/15/2014	1/1/2016	Completed
35	Halifax Health	EM Coordinator	All Hazard	P PP NS ES	VOL-0501 Addition of 800-ton chiller at main campus – initiative cancelled, per FDEM not an eligible project	HMGP	N/A	N/A	Terminated due to funding issues (not eligible).

SECTION 10: PLAN MAINTENANCE PROCEDURES

SECTION 10 – PLAN MAINTENANCE PROCEDURES

44 CFR Requirement**44 CFR Part 201.6(c)(4)(i):**

The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.

44 CFR Part 201.6(c)(4)(ii):

The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

This section of the Plan discusses how the Mitigation Strategy and Mitigation Action Plan will be implemented and how the LMS will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following three subsections:

- ▶ **Implementation**
- ▶ **Monitoring, Evaluation and Enhancement**
- ▶ **Continued Public Involvement**

10.1 IMPLEMENTATION

Each agency, department or other partners participating under the Volusia County Multi-jurisdictional LMS is responsible for implementing specific mitigation actions as prescribed in the Mitigation Action Plan. Every proposed action listed in the Mitigation Action Plan is assigned to a specific “lead” agency or department in order to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. Volusia County and its participating jurisdictions and partners will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments¹. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

Volusia County will integrate this Mitigation Plan into relevant County government decision making processes or mechanisms. This includes integrating the Mitigation Plan requirements into other local planning documents, processes or mechanisms, such as comprehensive or capital improvement plans, when appropriate. Members of the LMS Working Group will ensure that the goals and strategies of new

¹ A listing of key federal hazard mitigation funding sources can be found in the *Guide to Funding and Technical Assistance Programs*, provided as a separate annex to this Plan.

SECTION 10: PLAN MAINTENANCE PROCEDURES

and updated local planning documents for their agencies or departments are consistent and do not conflict with the goals and actions of the LMS and will not contribute to increased hazard vulnerability in the County.

Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the LMS Working Group and through the five-year review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Mitigation Plan is deemed by the Volusia County LMS Working Group to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

10.2 MONITORING, EVALUATION AND ENHANCEMENT

Periodic revisions and updates of the LMS are required to ensure that the goals of the Plan are kept current and account for potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

The Volusia County LMS Working Group will continue to meet at least annually and following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the Plan is continuously updated to reflect changing conditions and needs within Volusia County. If determined appropriate or as requested, an annual report on the Plan will be developed and presented to the Volusia County Council in order to report progress on the actions identified in the Plan and to provide information on the latest legislative requirements and/or changes to those requirements.

10.2.1 Five (5) Year Plan Review

The Plan will be thoroughly reviewed by the LMS Working Group every five years to determine whether there have been any significant changes in Volusia County that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, increased exposure to hazards, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The plan review provides Volusia County officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. Volusia County Emergency Management Services department will be responsible for reconvening the LMS Working Group and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

SECTION 10: PLAN MAINTENANCE PROCEDURES

- ▶ Do the goals address current and expected conditions?
- ▶ Has the nature or magnitude of risks changed?
- ▶ Are the current resources appropriate for implementing the Plan?
- ▶ Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- ▶ Have the outcomes occurred as expected?
- ▶ Did the County and participating agencies and other partners participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the Volusia County LMS will be submitted to the State Hazard Mitigation Officer at the Florida Division of Emergency Management (FDEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

5-Year Update Summary

Review Group Lead as of 3/6/2020: Aubrie Austin, Volusia County Emergency Management

Review Group Name: Volusia Prepares Working Group (see members on pages 2.5 and 2.6)

Interim LMS Review: LMS can be reviewed or commented on at any quarterly Volusia Prepares Meeting

2025 Review Date: The Volusia Prepares group will begin review no less than 365 days before the 2024-25 plan submittal date. This will ensure ample time to hire a contractor to complete the plan with all necessary community and municipal outreach completed.

Review Forum: Volusia Prepares Working Group Meetings (Quarterly)

10.2.2 Disaster Declaration

Following a disaster declaration, the Volusia County LMS will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of the Volusia County Emergency Management Services department to reconvene the LMS Working Group and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

10.2.3 Reporting Procedures

The results of the five-year review will be summarized by the LMS Working Group in a report that will include an evaluation of the effectiveness of the Plan and any required or recommended changes or amendments. The report will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommended strategies to overcome them.

10.2.4 Plan Amendment Process

Upon the initiation of the amendment process, Volusia County and its participating jurisdictions and partners will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected County departments, residents, and businesses. Information will also be

SECTION 10: PLAN MAINTENANCE PROCEDURES

forwarded to the Florida Division of Emergency Management. This information will be disseminated in order to seek input on the proposed amendment(s) for not less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the LMS Working Group for final consideration. The committee will review the proposed amendments along with the comments received from other parties, and, if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan to the Volusia County Council within 60 days.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the LMS Working Group:

- ▶ There are errors, inaccuracies or omissions made in the identification of issues or needs in the Plan;
- ▶ New issues or needs have been identified which are not adequately addressed in the Plan;
- ▶ There has been a change in information, data, or assumptions from those on which the Plan is based.

Upon receiving the recommendation from the LMS Working Group and prior to adoption of the Plan, the County will hold a public hearing if deemed necessary. The Volusia County Council will review the recommendation from the LMS Working Group (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the County Council will take one of the following actions:

- ▶ Adopt the proposed amendments as presented
- ▶ Adopt the proposed amendments with modifications
- ▶ Refer the amendments request back to the LMS Working Group for further revision, or
- ▶ Defer the amendment request back to the LMS Working Group for further consideration and/or additional hearings

10.3 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement

44 CFR Part 201.6(c)(4)(iii):

The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation and revision process will be made as necessary. These efforts may include:

SECTION 10: PLAN MAINTENANCE PROCEDURES

- ▶ Advertising meetings of the LMS Working Group in local newspapers, public bulletin boards and/or County office buildings
- ▶ Designating willing and voluntary citizens and private sector representatives as official members of the LMS Working Group
- ▶ Utilizing local media to update the public of any maintenance and/or periodic review activities taking place
- ▶ Utilizing the Volusia County website to advertise any maintenance and/or periodic review activities taking place, and
- ▶ Keeping copies of the Plan in public libraries

APPENDIX A: PLAN ADOPTIONS

This portion of the report compiles Resolutions of Adoption from member jurisdictions of Volusia County approving the 2020 LMS plan update.

APPENDIX A: PLAN ADOPTIONS

The City of South Daytona (1 of 2)

RESOLUTION NO. 2020-01

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, FLORIDA, AUTHORIZING THE ADOPTION OF THE 2020 VOLUSIA COUNTY MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY; PROVIDING FOR CONFLICTING RESOLUTIONS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the health and safety of the citizens of South Daytona, Volusia County and surrounding municipalities; and

WHEREAS, the City of South Daytona recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

WHEREAS, City of South Daytona has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the City of South Daytona, Volusia County and surrounding municipalities have identified, justified and prioritized proposed projects and programs to mitigate the vulnerabilities of municipal and unincorporated areas of Volusia County to the impacts of future flood events; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally subsidized flood insurance in communities that regulate development in floodplains; and

WHEREAS, the National Flood Insurance Program Community Rating System (CRS) rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements; and

WHEREAS, to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

WHEREAS, the adoption of the 2020 Volusia County Local Mitigation Strategy supports this effort; and

WHEREAS, the formal adoption of the Volusia County Local Mitigation Strategy, that incorporates the Integrated Floodplain Management Plan, by the local governing body is a requirement of the Community Rating System Program;

APPENDIX A: PLAN ADOPTIONS

The City of South Daytona (2 of 2)

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, VOLUSIA COUNTY, FLORIDA:

Section 1. Description of Actions. The City Council of the City of South Daytona approves the 2020 update to the Volusia County Multi-Jurisdictional Local Mitigation Strategy.

Section 2. Repealer. All prior resolutions, if any, which conflict with this resolution are hereby repealed.

Section 3. Severability. If any section, subsection, sentence, clause, phrase or portion of this resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or application hereof.

Section 4. Effective Date. This resolution shall become effective immediately upon its adoption.

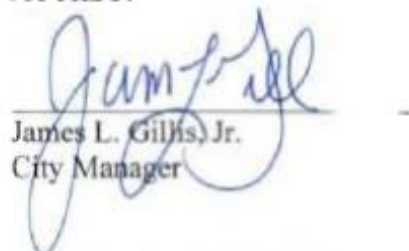
APPROVED AND ADOPTED upon first and final reading at the regular meeting by the City Council of the City of South Daytona, Florida, on the 14 day of January, 2020.

SIGNED:



William C. Hall, Mayor

ATTEST:



James L. Gillis, Jr.
City Manager

CERTIFIED AS TO FORM:



Scott Simpson
City Attorney

APPENDIX B: BYLAWS OF “VOLUSIA PREPARES”

Bylaws of “Volusia Prepares” The Volusia County Local Mitigation Strategy Steering Committee

ARTICLE I: PURPOSES OF THE TASK FORCE

The purpose of the Volusia County Local Mitigation Strategy Task Force, otherwise known as “Volusia Prepares”, is to decrease the vulnerability of the citizens, governments, businesses and institutions of Volusia County to the future human, economic and environmental costs of natural, technological, and societal disasters. The Task Force will develop, monitor, implement, and maintain a comprehensive plan for hazard mitigation which will be intended to accomplish this purpose.

ARTICLE II: MEMBERSHIP

Participation in Volusia Prepares is voluntary by all entities. Membership in Volusia Prepares is open to all jurisdictions, organizations and individuals supporting its purposes

ARTICLE III: ORGANIZATIONAL STRUCTURE

The organizational structure of Volusia Prepares shall consist of a Steering Committee and subcommittees as deemed necessary by the Steering Committee.

A. The Steering Committee

Volusia Prepares shall be guided by a Steering Committee consisting of designated representatives of the following:

- One representative from the government of Volusia County and each participating incorporated municipality,
- One representative from organizations and associations representing key business, industry, and community interest groups of Volusia County, and
- Other such individuals appointed by a majority vote of the Steering Committee.

Members of the Steering Committee will be designated by formal appointment or other action to serve as the official representative and spokesperson for the jurisdiction or organization regarding the activities and decisions of Volusia Prepares. To maintain good standing, members of the Steering Committee must not have more than two unexcused absences from meetings during the course of a year. Three or more unexcused absences during the course of one calendar year may result in HMGP grant funding ineligibility for those jurisdiction(s) during the next Presidentially declared disaster.

B. Subcommittees

Volusia Prepares may have permanent and/or temporary subcommittees as deemed necessary by the Steering Committee. Membership in the subcommittees is not restricted. There are no requirements for individuals to maintain good standing as members of a permanent or temporary subcommittee.

C. Program Staff

The Volusia County Emergency Management Division, or other agency as so designated by the Steering Committee, will serve as the program staff for Volusia Prepares, and assist in the coordination and support of Volusia Prepares activities.

APPENDIX B: BYLAWS OF “VOLUSIA PREPARES”

ARTICLE IV: OFFICERS

Any member in good standing of the Steering Committee is eligible for election as an officer. The Steering Committee will have a chair elected by a majority vote of a quorum of the members. The Steering Committee will also elect by majority vote a vice chair. Representatives of both local government and any participating private sector organizations will be eligible for election as an officer. Each will serve a term of one year, and be eligible for re-election for an unlimited number of terms. The chair and vice chair of the Steering Committee are also considered to be chair and vice chair of Volusia Prepares.

The chair of the Steering Committee will preside at each meeting of the Steering Committee, as well as establish temporary subcommittees and assign personnel to them. The vice chair will fulfill the duties and responsibilities of the chair in his or her absence.

The chair of each permanent or temporary subcommittee will be designated from the members in good standing of the Steering Committee by its chair, and will serve at the pleasure of the chair of the Steering Committee.

ARTICLE V: RESPONSIBILITIES

A. Steering Committee

The Steering Committee will be responsible for oversight and coordination of all actions and decisions by the Task Force, and is solely responsible for formal actions in the name of Volusia Prepares, including the release of reports, development of resolutions, issuance of position papers, and similar activities. The Steering Committee makes assignments to the subcommittees, coordinates their work, and takes action on their recommendations. Their goal is to make Volusia County disaster resistant by preventing or reducing the personal and economic loss from natural or man-made hazards through a partnership between government, businesses, organizations, associations, and citizens.

Objectives:

1. Keep the Volusia County Local Mitigation Strategy (LMS) document current (incorporating new projects, objectives, and goals).
2. Develop and maintain overall policies and procedures and integrate priorities of mitigation efforts.
3. Facilitate comprehensive effectiveness by coordinating with subcommittees.
4. Vote on proposed action plans and initiatives.
5. Develop a strategy to constantly identify and recruit new partners.
6. Develop a systematic method to share knowledge and market the need for being disaster resistant.
7. Promote accomplishments to elected officials and community.

B. Subcommittees

If established by the Steering Committee, subcommittees will have responsibilities as assigned by the Steering Committee members.

APPENDIX B: BYLAWS OF “VOLUSIA PREPARES”

C. Program Staff

Technical, clerical and other types of support activities to the Steering Committee and subcommittees will be provided through the Volusia County Emergency Management Division or other agency or organizational staff as designated by the Steering Committee. The Steering Committee will also designate an agency of Volusia County to serve as the legal representative and agent of Volusia Prepares, and to be empowered under County statutes to accept and disburse funds, enter into contracts, hire staff, and take such other actions as necessary in support of, or for the benefit of, the Task Force. Other jurisdictions and organizations may also provide such services on a voluntary basis upon request of the chair of the Steering Committee.

ARTICLE VI: ACTIONS BY THE TASK FORCE

A. Authority for Actions

Only the Steering Committee has the authority to take final actions in the name of Volusia Prepares. Actions by subcommittees or program staff are not considered as final until affirmed by action of the Steering Committee.

B. Meetings, Voting and Quorum

Meetings of the Steering Committee and its subcommittees will be conducted in accord with Robert's Rules of Order, if and when deemed necessary by chair of the meeting. Regular meetings of the Steering Committee will be scheduled at least quarterly with a minimum of 10 working days' notice. Subcommittees will meet at least quarterly prior to Steering Committee meetings, or more frequently as deemed necessary, at the discretion of their chairperson.

All final actions and decisions made in the name of Volusia Prepares will be by affirmative vote of a quorum of the Steering Committee. A quorum shall be 50 percent of the members of the Steering Committee in good standing at the time of the vote. Each member of the Steering Committee will have one vote. Voting by proxy, written or otherwise, is permitted.

C. Special Votes

Special votes may be taken under emergency situations or when there are other extenuating circumstances as determined by the chair and/or vice chair of the Steering Committee. Special votes may be made by telephone, email, webinar, or any electronic means, or first class mail, and shall be in accord with all applicable quorum rules for such actions.

D. Public Hearings

When required by statute or the policies of Volusia County, or when deemed necessary by the Steering Committee, a public hearing regarding actions under consideration for implementation by Volusia Prepares will be held.

E. Documentation of Actions

All meetings and other forms of action by the Steering Committee and permanent subcommittees (if established) will be documented and made available for inspection by the public.

APPENDIX B: BYLAWS OF "VOLUSIA PREPARES"

ARTICLE VII: ADOPTION OF AMENDMENTS AND CHANGES TO THE BYLAWS AND "VOLUSIA PREPARES" LOCAL MITIGATION STRATEGY DOCUMENT

The Bylaws of Volusia Prepares and the "*Volusia Prepares*" Local Mitigation Strategy document may be adopted and/or amended by a two-thirds majority vote of the members in good standing of the Steering Committee at any time. All proposed changes to the bylaws and "*Volusia Prepares*" Local Mitigation Strategy document will be provided to each member of the Steering Committee prior to voting on the proposed changes. Routine changes, additions, deletions, and deferment of mitigation initiatives and any other changes to the document may be made at any time by majority vote. Voting may be by telephone, email, webinar, or any electronic means, or first class mail. A 45-day public review and comment period shall apply to the five-year FEMA required update of the "*Volusia Prepares*" LMS Document.

ARTICLE VIII: DISSOLUTION OF THE TASK FORCE

The Task Force may be dissolved by affirmative vote of 100% of the members in good standing of the Steering Committee at the time of the vote, by order of a court of competent jurisdiction, and/or by instruction of the Volusia County governing body. At the time of dissolution, all remaining documents, records, equipment and supplies belonging to the Task Force will be transferred to Volusia County for disposition.

APPENDIX C: LOCAL MITIGATION PLAN CROSSWALK

Included below is a link to the Florida Local Mitigation Strategy (LMS) Crosswalk excel document, which incorporates the National Flood Insurance Program's (NFIP) Community Rating System (CRS) into the Local Mitigation Strategy planning process. The information in this document (including all tabs) is subject to state review and can be found at the link below.

[Link to Crosswalk \(click to view online\)](http://ftp.ecfrpc.org/Live%20Links/)

Link text: [ftp://ftp.ecfrpc.org/Live%20Links/](http://ftp.ecfrpc.org/Live%20Links/)

Click on "Volusia LMS Crosswalk"

APPENDIX D: MEETING INFORMATION

Meeting Information

This section of the Volusia Local Mitigation Strategy includes documentation (agendas, sign in sheets, other items) for the meetings held as part of the planning process. The planning team held three meetings, which are summarized below:

- September 11, 2019: LMS Working Group Meeting #1
 - Open to public
- October 29, 2019: Public Meeting
 - Open to public at two separate locations:
 - Daytona Beach Regional Library
 - DeLand Regional Library
- December 11, 2019: LMS Working Group Meeting #2
 - Open to public

Documentation for these meetings is found on the following pages of this appendix, including:

- Sign-In Sheets
- Agendas
- Public Participation Forms
- Press Releases, Emails Concerning Upcoming Meetings
- Email Distribution List

APPENDIX D: MEETING INFORMATION

September 11, 2019: LMS Working Group Meeting #1

Agenda

Volusia Prepares

Local Mitigation Working Group Quarterly Meeting
CRS Users Group Meeting LMS Working Group Members
Aubrie Austin, Program Coordinator
September 11, 2019 9:00 AM

Agenda

- **Welcome/Introductions**
- **Approval of meeting minutes from June 12, 2019**
- **Mitigation initiatives requiring review and adoption:** No new projects submitted
- **Florida Forest Service/Bunnell District:** Local Mitigation Strategy addendum, Julie Allen & Will Raulerson
- **2020 LMS Review:** The LMS 5-year review is coming up in 2020. The East Central Florida Regional Planning council is updating the LMS.
 - ECFRPC discussion
 - Bylaws & goals/objectives review
- **Official vote on sun set date for initiatives**
- **Upcoming training**
 - **G557 Rapid Needs Assessment:** October 30, 2019, 3825 Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124
 - **AWR Understanding Targeted Cyber Attacks:** November 5, 2019, Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124
 - **MGT 465 Recovering from Cybersecurity Incidents:** November 6-7, 2019, Tiger Bay Rd. Ste. 102, Daytona Beach, FL 32124

APPENDIX D: MEETING INFORMATION

Sign-In Sheet

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, September 11, 2019					
Jurisdiction	Representative	Phone	Email Address	LMS	CRS
Advent Health	Mike Poinatowski	386-316-1120	michael.poinatowski@adventhealth.com		
Halifax Hospital	Ashley Fisher	407-454-0730	ashley.fisher@halifax.org		
	Sharon Warriner	386-425-7342	sharon.warriner@halifax.org		
Florida Forest Service	Julie Allen	386-585-6156	Julie.Allen@FreshFromFlorida.com		
Residents					
DB Airport	Karen Feaster		kfeaster@volusia.org		

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, September 11, 2019					
Jurisdiction	Representative	Phone	Email Address	LMS	CRS
Ormond Beach	Becky Weedo	386-676-3342	weedo@ormondbeach.org		
	Loretta Moisio	386-676-3315	moisio@ormondbeach.org		
Pierson	Carmen Spelorzi	386-749-2661	carmen@townofpierson.org		
Ponce Inlet	Hank Baker	386-236-2185	hbaker@ponce-inlet.org		
	Ami Pierce	386-236-2186	apierce@ponce-inlet.org		
Port Orange	Amanda Lasecki	386-506-5737	alasecki@port-orange.org		
	Shannon Ball	386-506-5903	sball@port-orange.org		
South Daytona	Patty Rippey	386-322-3016	prippey@southdaytona.org		
VC Health Department	Jeanine Robinson	386-274-0705	jeanine.robinson@flhealth.gov		
VC School Board	John Kraft	386-333-2075	jrkraft@volusia.k12.fl.us		
County Departments					
VC Emergency Mgmt	Larry LaHue	386-254-1500	llahue@volusia.org		
	Aubrie Austin	386-254-1500	alaustin@volusia.org		
	Jill Hemmerlein	368-254-1500	jhemmerlein@volusia.org		
VC Fire Services	Kate Lind	386-736-5940	klind@volusia.org		
	Howard Bailey	386-527-1404	hbailey@volusia.org		
VC Public Works	Arden Fontaine		afontaine@volusia.org		
VC GIS	Nancy Church	386-736-5922	nchurch@volusia.org		
VC Public Protection					

APPENDIX D: MEETING INFORMATION

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, September 11, 2019					
Jurisdiction	Representative	Phone	Email Address	LMS	CRS
<u>Cities</u>					
Daytona Beach	Kimberly Dixon	386-671-8807	dixonkimberly@CODB.us		
	Justin Barton	386-671-8807	BartonJustin@CODB.us		
	Michael Smith	386-871-8871	smithmike@CODB.us		
Daytona Beach Shores	Stewart Cruz	386-843-2404	SCruz@cityofdb.org		
	Lori Irwin	386-763-5328	lirwin@cityofdb.org		
DeBary	Alan Williamson	386-601-0208	awilliamson@debary.org		
DeLand	Maria Becker	386-626-7097	beckerm@deland.org		
	Jonathan Jacob	386-626-7097	jacobi@deland.org		
Deltona	Sue Houle	386-878-8163	shoule@deltonafl.gov		
	Bill Snyder	386-575-6902	bsnyder@deltonafl.gov		
	Dean Debose	386-575-6905	ddebose@deltonafl.gov		
Edgewater	Tyna Hilton	386-424-2400	thilton@cityofedgewater.org		
Holly Hill	Steve Juengst	386-248-9463	sjuengst@hollyhillfl.org		
Lake Helen	Katie Holmes	386-228-2121	kholmes@lakehelen.com		
New Smyrna Beach	David Hamstra	407-992-9160	david@PegasusEngineering.net		
	Kyle Fegley	386-410-2811	kfegley@cityofnsb.com		
Oak Hill	Amanda Osweiler	386-345-6855	osweilera@oakhill.com		
Orange City	Joseph Ruiz	386-775-5415	jruiz@ourorangecity.com		

* Michelle Cechowski, PJ Smith and Mark Realı attended the meeting on behalf of the ECFRPC.

APPENDIX D: MEETING INFORMATION

December 11, 2019: LMS Working Group Meeting #2

Agenda

Volusia Prepares

Local Mitigation Working Group Quarterly Meeting
 CRS Users Group Meeting LMS Working Group Members
 Aubrie Austin, Program Coordinator
 December 11, 2019 9:00 AM

Agenda

- **Welcome/Introductions**
- **Approval of meeting minutes from September 11, 2019**
- **Mitigation initiatives requiring review and adoption:** No new projects submitted
- **2020 LMS Review:** The LMS 5-year review is coming up in 2020. The East Central Florida Regional Planning council will update the committee on the progress of the LMS.
- **ECFRPC surge/sea level rise models for the FDEP project**
- **CDBG- DR Mitigation informational Briefing:** Volusia County Community Assistance
- **Upcoming training**
 - G300: Intermediate Incident Command- January 7-9, 2020
 - AWR 328: All Hazards Preparedness for Animals in Disasters- February 25,2020
 - MGT 448: All Hazards Planning for Animal, Agriculture & Food Related Disasters- February 26,2020
 - G400: Advanced Incident Command- March 3 & 4, 2020
 - MGT 323: Instructor Development Workshop- March 24-26, 2020
- **Open discussion**

APPENDIX D: MEETING INFORMATION

Sign-In Sheet

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, December 11, 2019					
Jurisdiction	Representative	Phone Number	Email Address	LMS	CRS
<u>Cities</u>					
Daytona Beach	Kimberly Dixon	386-671-8807	dixonkimberly@CODB.us		
	Justin Barton	386-671-8807	Barton.Justin@CODB.us	✓	
	Michael Smith	386-871-8871	smithmike@CODB.us		
Daytona Beach Shores	Stewart Cruz	386-843-2404	SCruz@cityofdbbs.org		
	Lori Irwin	386-763-5328	linwin@cityofdbbs.org	✓	✓
DeBary	Alan Williamson	386-601-0208	awilliamson@debary.org	✓	
	<i>Donna Hamilton</i>			✓	
DeLand	Maria Becker	386-626-7097	beckerm@deland.org	✓	
	Jonathan Jacob	386-626-7097	jacobj@deland.org		
Deltona	Sue Houle	386-878-8163	shoule@deltonafl.gov	SAH	
	Bill Snyder	386-575-6902	bsnyder@deltonafl.gov		
	Dean Debose	386-575-6905	ddebose@deltonafl.gov		
Edgewater	Tyna Hilton	386-424-2400	thilton@cityofedgewater.org		
				✓	
Holly Hill	Steve Juengst	386-248-9463	sjuengst@hollyhillfl.org	✓	
	<i>Jeff Miller</i>	<i>386 248 9488</i>	<i>JMiller@hollyhillfl.org</i>	✓	✓
Lake Helen	Katie Holmes	386-228-2121	khomes@lakehelen.com	✓	
New Smyrna Beach	David Hamstra	407-992-9160	david@PegasusEngineering.net	✓	
	Kyle Fegley	386-410-2811	kfegley@cityofnsb.com		
Oak Hill	Amanda Osweiler	386-345-6855	osweilera@oakhill.com	✓	
Orange City	Joseph Ruiz	386-775-5415	jruiz@ourorangecity.com		

Attachment: Volusia County LMS 2020 Part II (2020-R-22 : Volusia County Local Mitigation Strategy)

APPENDIX D: MEETING INFORMATION

Sign-In Sheet (2 of 3)

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, Decemebr 11, 2019					
Jurisdiction	Representative	Phone Number	Email Address	LMS	CRS
Ormond Beach	Becky Weedo	386-676-3342	weedo@ormondbeach.org	BW	BW
	Loretta Moisio	386-676-3315	moisio@ormondbeach.org	LM	LM
Pierson	Carmen Spelorzi	386-749-2661	carmen@townofpierson.org		
Ponce Inlet	Hank Baker	386-236-2185	hbaker@ponce-inlet.org	HB	HB
	Ami Pierce	386-236-2186	apierce@ponce-inlet.org		
Port Orange	Amanda Lasecki	386-506-5737	alasecki@port-orange.org		
	Shannon Ball	386-506-5903	sball@port-orange.org	SB	
South Daytona	Patty Rippey	386-322-3016	prippey@southdaytona.org	PR	PR
VC Health Department	Jeanine Robinson	386-274-0705	jeanine.robinson@flhealth.gov	JR	
	Robert Maglievaz	386-274-0691	RobertMaglievaz@flhealth.gov		
VC School Board	John Kraft	386-333-2075	irkraft@volusia.k12.fl.us	JK	JK
County Departments					
VC Emergency Mgmt	Jill Hemmerlein	386-254-1500	jhemmerlein@volusia.org	EH	
	Aubrie Austin	386-254-1500	alaustin@volusia.org		
	Tom Cisco	386-254-1500	tcisco@volusia.org	TC	
VC Fire Services	Kate Lind	386-736-5940	klind@volusia.org	KL	
	Howard Bailey	386-527-1404	hbailey@volusia.org		
VC Public Works	Arden Fontaine	386-736-5965	afontaine@volusia.org	AF	
VC GIS	Nancy Church	386-736-5922	nchurch@volusia.org		
VC Public Protection					
VC COASTAL DIV. JOE NOLIN 386-547-0122 JNOLIN@VOLUSIA.ORG					

Attachment: Volusia County LMS 2020 Part II (2020-R-22 : Volusia County Local Mitigation Strategy)

APPENDIX D: MEETING INFORMATION

Sign-In Sheet (3 of 3)

Volusia Prepares - Working Group Quarterly Meeting					
Wednesday, December 11, 2019					
Jurisdiction	Representative	Phone Number	Email Address	LMS	CRS
Advent Health	Mike Poinatowski	386-316-1120	michael.poinatowski@adventhealth.com		
Halifax Hospital	Ashley Fisher	407-454-0730 ✓	ashley.fisher@halifax.org ✓	RF	
	Sharon Warriner	386-425-7342	sharon.warriner@halifax.org	N/A	
Florida Forest Service	Julie Allen	386-585-6156	Julie.Allen@FreshFromFlorida.com		
Residents					
DB Airport	Karen Feaster		kfeaster@volusia.org		
Community Assistance	Cory Brown	386-736-5955	cbrown@volusia.org		
ECFRPC	Mark Reali	407-245-0300	mreali@ecfrpc.org		
ECFRPC	Brandon Gunn	813-966-0634	bgunn@ecfrpc.org		
VC Environmental Mgmt	Megan Martin	386-736-5927	mmartin@volusia.org	✓	
FDPM	Claudia Baker	850-519-6734	claudia.baker@myfloridatourism.com		
ECFRPC	PJ Smith	407-476-5443	pj.smith@ecfrpc.org	✓	
ECFRPC	Charles Abbatantuono	407-212-0304	abbatantuono@knights.wf.edu	✓	
APTIM	Pat White	386-299-7754	patricia.white@APTIM.org		
ECFRPC	Tara McGue	407-245-0300	tara@ecfrpc.org		

Attachment: Volusia County LMS 2020 Part II (2020-R-22 : Volusia County Local Mitigation Strategy)

APPENDIX D: MEETING INFORMATION

Outreach Emails for LMS Meetings (9/11/2019 Meeting)

-----Original Message-----

From: Aubrie Austin <alaustin@volusia.org>

Sent: Friday, September 06, 2019 10:42 AM

To: bill.coulson@AHSS.org; JSweeney@cityofdbfs.org; lirwin@cityofdbfs.org; scruez@cityofdbfs.org; thilton@CITYOFEDGEWATER.ORG; kmcneely@cityofflaglerbeach.com; Kyle Fegley <KFegley@cityofnsb.com>; svandemark@cityofnsb.com; Justin Barton <BartonJustin@CODB.US>; Curtis Burkett <burkettcurtis@CODB.US>; DixonK@CODB.US; SmithHardy@CODB.US; WallerDavid@CODB.US; awilliamson@debary.org; beckerm@deland.org; Greboszm@deland.org; Sue Houle <shoule@deltonafl.gov>; smcgrath@deltonafl.gov; Mike Poniatowski <Michael.Poniatowski@fhmmc.org>; lnelson@flaglercounty.org; Jeanine Robinson <Jeanine.Robinson@flhealth.gov>; Robert Maglievaz <robert.maglievaz@flhealth.gov>; Julie Allen <julie.Allen@freshfromflorida.com>; Ashley.Fisher@halifax.org; bob.williams@halifax.org; sharon.warriner@halifax.org; sjuengst@hollyhillfl.org; katie Holmes <kholmes@lakehelen.com>; evansk@oakhillfl.com; osweilera@oakhillfl.com; moisio@ormondbeach.org; Steven.Spraker@ormondbeach.org; Weedo@ormondbeach.org; BMendez@ourorangecity.com; Ronnie Long <rlong@ourorangecity.com>; david@pegasusengineering.net; Leylah Saavedra <leylah@pegasusengineering.net>; Hank Baker <hbaker@ponce-inlet.org>; alasecki@port-orange.org; Sylvester Alison <asylvester@port-orange.org>; jguido@port-orange.org; mmomberger@port-orange.org; Shannon Ball <sball@port-orange.org>; Abby Johnson <ajohnson@sjrwmd.com>; prippey@southdaytona.org; carmen@townofpierson.org; Chris Boyer <cjboyer@volusia.k12.fl.us>; Greg Akin <GPAKIN@volusia.k12.fl.us>; reyoung@volusia.k12.fl.us; Arden Fontaine <AFontaine@volusia.org>; Charles Kamine <CKamine@volusia.org>; Eric Gebo <EGebo@volusia.org>; Judy Grim <JGrim@volusia.org>; John Stockham <JStockham@volusia.org>; Karen Feaster <KFeaster@volusia.org>; Michael Ulrich <MUlrich@volusia.org>; Nancy Church <NChurch@volusia.org>; Patricia Bythwood <PBythwood@volusia.org>; Sean Maroney <SMaroney@volusia.org>; Tom Cisco <TCisco@volusia.org>

Cc: Michelle Cechowski <michelle@ecfrpc.org>

Subject: Meeting Next Week

Good Morning Volusia Prepares,

I hope everyone is having a wonderful Friday! Our next meeting is Wednesday, September 11, 2019 @ 9:00 A.M.. This meeting we will have the East Central Florida Regional Planning Council there to discuss the update of the County's LMS. To help with this process I have attached 2 documents that need to be reviewed. I also am in need of the critical facilities in your jurisdiction to ensure the list is up to date in the plan. Please send me your critical facilities list as soon as you can. The deadline is Friday, September 20, 2019. If you have any questions please don't hesitate to ask. We will also have the Florida Forest Service at the meeting to discuss mitigation activities.

Have a Wonderful Day,

Aubrie Austin
Planner II
Volusia County Emergency Management
3825 Tiger Bay Rd. Ste 102
Daytona Beach, FL 32124
(386)-254-1500 ext. 11625
alaustin@volusia.org

Attachment: Volusia County LMS 2020 Part II (2020-R-22 : Volusia County Local Mitigation Strategy)

APPENDIX D: MEETING INFORMATION

Outreach Emails for LMS Meetings (12/11/2019 Meeting; part 1 of 2)

 Tue 12/10/2019 10:49 AM

Aubrie Austin <alaustin@volusia.org>

Wednesday, December 11, 2019 meeting

To: bill.coulson@AHSS.org; JSweeney@cityofdb.com; linwin@cityofdb.com; scrutz@cityofdb.com; thilton@CITYOFEDGEWATER.ORG; Kyle Fegley; svandemark@cityofnsb.com; Justin Barton; Curtis Burkett; DixonK@CODB.US; SmithHardy@CODB.US; WallerDavid@CODB.US; awilliamson@debary.org; becker@deland.org; Greboszm@deland.org; Dean Debose; Sue Houle; smcgrath@deltonafl.gov; Mike Poniatowski; Inelson@flaglercounty.org; Jeanine Robinson; Robert Maglievaz; Julie Allen;

Cc: Michelle Cechowski; PJ Smith; Tara McCue; Corry Brown

 You replied to this message on 12/10/2019 11:49 AM.

Outlook item

 121119 Volusia Prepares Agenda.pdf
162 KB

 09112019 Volusia Prepares LMS meeting summary.pdf
104 KB

Bing Maps Suggested Meetings Action Items + Get more add-ins

Good Morning All,

I hope everyone is having a stress-free December! Tomorrow at 9 A.M. is the last LMS meeting for 2019 and attached is the agenda, along with the meeting minutes from September.

There are a couple of items that I would like to bring to everyone's attention. The first is a project that the Regional Planning Council is working on with FDEP. They will be showing the project and talking about it at the meeting. For a preview the link is provided below. There is a questionnaire attached as well for feedback.

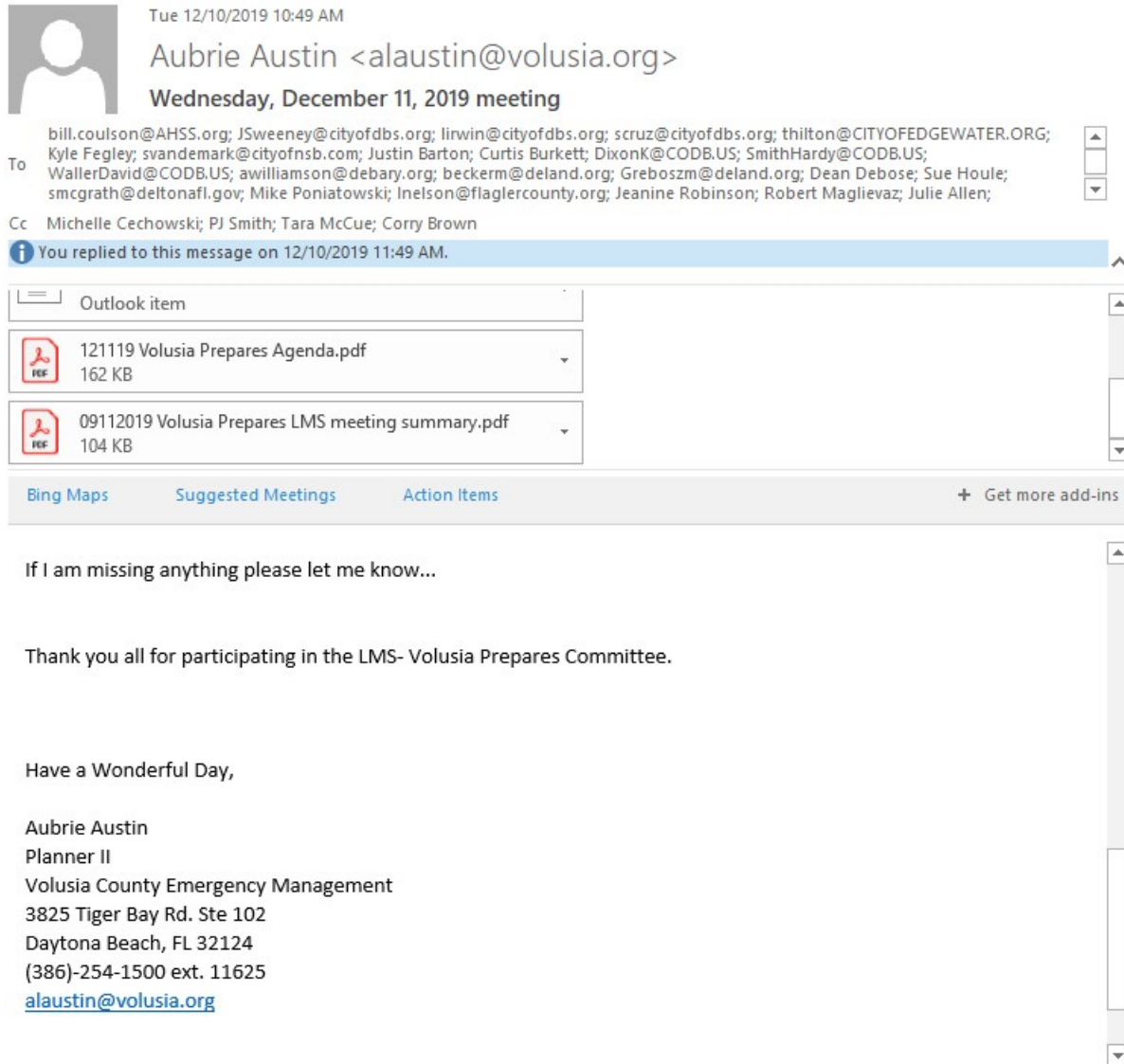
<http://ecfrpc.maps.arcgis.com/apps/webappviewer/index.html?id=4174f376b173413a973103bbfc9a30e6>

User Name: ecfrpc
Password: ecfrpc2015

The next item that will be discussed is the CDBG-MIT, which is in response to Hurricanes Hermine and Matthew. A draft plan has been created and there are 30 days to review it. The link is provided below.

APPENDIX D: MEETING INFORMATION

Outreach Emails for LMS Meetings (12/11/2019 Meeting; part 2 of 2)



Attachment: Volusia County LMS 2020 Part II (2020-R-22 : Volusia County Local Mitigation Strategy)

APPENDIX D: MEETING INFORMATION

Meeting Outreach Distribution List

To: Akin, Greg	To: Rippey, Patty
To: Allen, Julie	To: Robinson, Jeanine
To: Bailey, Howard	To: Saavedra, Leylah
To: Baker, Claudia	To: Smith, Hardy
To: Baker, Hank	To: Spelorzi, Carmen
To: Ball, Shannon	To: Spraker, Steven
To: Barton, Justin	To: Stockham, John
To: Becker, Maria	To: Sweeney, Joanne
To: Boyer, Chris	To: Sylvester, Alison
To: Burkett, Curtis	To: Ulrich, Michael
To: Bythwood, Patricia	To: Vandemark, Shawn
To: Cechowski, Michelle	To: Waller, David
To: Church, Nancy	To: Warriner, Sharon
To: Clisco, Tom	To: Weedo, Becky
To: Coulson, William	To: White, Pat
To: Cruz, Stewart	To: Williams, Bob
To: Debose, Dean	To: Williamson, Alan
To: Dixon, Kimberly	To: Young, Ronald E.
To: Evans, Kohn	
To: Feaster, Karen	
To: Fegley, Kyle	
To: Fisher, Ashley	
To: Fontaine, Arden	
To: Gebo, Eric	
To: Grebosz, Mike	
To: Hamstra, David	
To: Hemmerlein, Jill	
To: Hilton, Tyna Lynn	
To: Holmes, Katie	
To: Houle, Sue	
To: Hutchinson, Denise	
To: Irwin, Lory	
To: Johnson, Abby	
To: Juengst, Steven	
To: Kamine, Charles	
To: Kraft, John	
To: Lasecki, Amanda	
To: Lind, Kate	
To: Long, Ronnie	
To: Maglievaz, Robert	
To: Maroney, Sean	
To: McGrath, Scott	
To: Mendez, Becky	
To: Moisio, Loretta	
To: Mombberger, Margaret	
To: Nelson, Laura	
To: Oswelter, Mandy	
To: Poniatowski, Mike	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

This section of the Local Mitigation Strategy cross-references the locations of all critical facilities within Volusia County and its jurisdictions with environmental layers pertaining to the following hazard layers:

- Flood Zone
- Fire Risk Zone
- Storm Surge Zone
- Evacuation Zone
- Wind Risk
- Tornadoes (1950-2019)
- Sea Level Rise

There are approximately 363 critical facilities within Volusia County and its jurisdictions. The critical facilities covered in this report cover the following types of facilities.

- Administrative Buildings (non-city hall)
- Airports
- City Halls
- Elderly Care Facilities
- Emergency Operations Center (Volusia County EOC)
- Fire Stations
- Industrial Buildings
- Medical Facilities (clinics not included)
- Police Stations
- Schools and Colleges
- Utilities

Also covered in this section are **Water and Sewage Treatment Facilities**, **State Facilities** within flood zones, and **Lift Stations** as provided by county jurisdictions.

The tables on the following six pages depict the critical facilities, by jurisdiction and facility type, that are located within Volusia County, Florida. Each critical facility is cross-referenced with environmental hazard zones to depict risk for the natural hazards listed above.

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 1)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Air Cargo Building	401 INNOVATION WAY	Daytona Beach	Low Risk	101-105	None	
Aluma Shield of Daytona Beach	405 FENTRESS BLVD	Daytona Beach	Low Risk	96-100	None	
Animal Control	1250 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Beach Services	145 DUNLAWTON AV	Daytona Beach	Low Risk	101-105	Category 2	VE
Bonner Elementary School (Chiles Academy)	868 GEORGE W ENGRAM Blvd	Daytona Beach	Low Risk	101-105	Category 3	
Branch Jail	1300 RED JOHN DR	Daytona Beach	Low Risk	101-105	None	
Campbell Junior High School	625 S KEECH STREET	Daytona Beach	Low Risk	101-105	Category 3	
Communications Trailer	65 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Community Services - Veterans Services	1845 HOLSONBACK DR	Daytona Beach	Low Risk	96-100	None	
Correctional Facility	1354 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Cypress Street School	925 George W Engram Blvd	Daytona Beach	Low Risk	101-105	Category 3	AE
Daytona Beach 2	126 BOTEFUHR AV	Daytona Beach	Low Risk	101-105	Category 3	
Daytona Beach 4	1675 MASON AV	Daytona Beach	Very High Risk	101-105	None	
Daytona Beach 6	2020 BEVILLE RD	Daytona Beach	High Risk	101-105	None	AE
Daytona Beach 7	2545 LPGA BLVD	Daytona Beach	High Risk	96-100	None	
Daytona Beach City Hall	301 S RIDGEWOOD AV	Daytona Beach	Low Risk	101-105	Category 2	
Daytona Beach Fire Station #1	301 BEACH ST	Daytona Beach	Low Risk	101-105	Category 2	
Daytona Beach Fire Station #3	945 N HALIFAX AV	Daytona Beach	Low Risk	101-105	Category 4	
Daytona Beach Fire Station #5	627 N NOVARD	Daytona Beach	Very High Risk	101-105	Category 3	
Daytona Beach Police Department Beachside Precinct	510 HARVEY ST	Daytona Beach	Low Risk	101-105	Category 3	
Daytona Beach Police Headquarters	129 VALOR BLVD	Daytona Beach	Very High Risk	96-100	None	
Daytona Beach Regional Airport	700 CATALINA DR	Daytona Beach	Low Risk	101-105	None	
Daytona Law Center - Public Defender	442 S BEACH ST	Daytona Beach	Low Risk	101-105	Category 1	
Daytona State College	1200 W INTL SPEEDWAY	Daytona Beach	Low Risk	101-105	None	
Deputy Stephen Saboda Training Center	3901 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
Eastside Data Center	49 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Economic Development	700 CATALINA DR	Daytona Beach	Low Risk	101-105	None	
Embry Riddle Aeronautical University	1 Aerospace Blvd	Daytona Beach	Low Risk	101-105	None	
Emergency Management	3825 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
Environmental Lab Health Department	1250 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Environmental Lab Trailer	1251 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Environmental Management	440 S BEACH ST	Daytona Beach	Low Risk	101-105	Category 2	
EOC Tower Site	49 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
EOC-B	3820 OLD DELAND RD	Daytona Beach	Low Risk	101-105	None	
Facilities Building	3811 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
Federal Bureau of Investigation	444 SEABREEZE BLVD STE 300	Daytona Beach	Low Risk	101-105	Category 3	
Fire Training Center 15	3889 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
FL National Guard	405 BASIN ST	Daytona Beach	Low Risk	101-105	Category 2	
Fleet Management	1270 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
FS - Daytona Beach International Airport (DBIA)	2316 BELLEVUE AV	Daytona Beach	Low Risk	101-105	None	
Fuel Site - Indian Lake Road	1336 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Halifax 11	1580 DERBYSHIRE RD	Daytona Beach	Very High Risk	96-100	None	
Halifax Health	303 N CLYDE MORRIS BLVD	Daytona Beach	Low Risk	101-105	None	
Health Department	1845 HOLSONBACK RD	Daytona Beach	Low Risk	96-100	None	
Health Department	421 S KEECH ST	Daytona Beach	Low Risk	101-105	Category 3	AE
Health Department	775 HARVEY STRICKLAND BLVD ST 110	Daytona Beach	High Risk	96-100	None	
Humana Hospital	1500 BEVILLE ROAD	Daytona Beach	Low Risk	101-105	None	
IT Telecommunications	49 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Mainland High School	1255 W INTL SPEEDWAY	Daytona Beach	Low Risk	101-105	None	
Mary Bethune Cookman University	640 Mary McLeod Bethune Blvd	Daytona Beach	Low Risk	101-105	Category 3	A
Medical Examiner	1360 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 2)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Ocean Center	101 N ATLANTIC AV	Daytona Beach	Low Risk	101-105	Category 3	
S James Foxman Justice Center	251 N RIDGEWOOD AV	Daytona Beach	Low Risk	101-105	Category 2	
Sheriff - Information Technology	59 KEYTON DR	Daytona Beach	Low Risk	101-105	None	
Sheriff Operations / IT	1330 INDIAN LAKE RD	Daytona Beach	Low Risk	101-105	None	
Sheriff's Communication Center	3825 TIGER BAY RD	Daytona Beach	Low Risk	101-105	None	
SO - Airport Unit	700 CATALINA DR STE 110	Daytona Beach	Low Risk	101-105	None	
Tag & Title Office (West Concourse)	101 N ATLANTIC AV	Daytona Beach	Low Risk	101-105	Category 3	
Tiger Bay State Forest Office	4316 W INTL SPEEDWAY BLVD	Daytona Beach	Low Risk	96-100	None	A
Turie T. Small Elementary School	800 SOUTH STREET	Daytona Beach	Low Risk	101-105	Category 3	AE
Volusia County Beach Patrol	515 S Atlantic Ave	Daytona Beach	Low Risk	101-105	Category 4	
Volusia County Courthouse Annex	125 E ORANGE AV	Daytona Beach	Low Risk	101-105	Category 3	
Votran Bus Terminal / Parking Garage	699 EARL ST	Daytona Beach	Low Risk	101-105	Category 4	
Votran Transfer Plaza - Bus Terminal	207 DR MARY MCLEOD BETHUNE BLVD	Daytona Beach	Low Risk	101-105	Category 3	
Westside Elementary School	1210 JIMMY ANN DRIVE	Daytona Beach	Low Risk	101-105	None	
Community Center	3000 Bellemead Dr	Daytona Beach Shores	Low Risk	101-105	Category 4	
Daytona Beach Shores 77	3050 S ATLANTIC AV	Daytona Beach Shores	Low Risk	101-105	Category 4	
Daytona Beach Shores City Hall	2990 South Atlantic Ave	Daytona Beach Shores	Low Risk	101-105	Category 4	
Daytona Beach Shores Police Department	3050 S ATLANTIC AV	Daytona Beach Shores	Low Risk	101-105	Category 4	
Dunlawton Control Tower	3427 S ATLANTIC AV	Daytona Beach Shores	Low Risk	101-105	Category 1	VE
Public Safety	3050 South Atlantic Ave	Daytona Beach Shores	Low Risk	101-105	Category 4	
Public Works	11 Bellemead Dr	Daytona Beach Shores	Low Risk	101-105	Category 4	
Senior Center	3048 South Atlantic Ave	Daytona Beach Shores	Low Risk	101-105	Category 4	
City of DeBary City Hall	16 Colomba Road	DeBary	Very High Risk	96-100	None	
City of DeBary Town Hall	12 Colomba Road	DeBary	Very High Risk	96-100	None	
District 5 Sheriff's Office	79 S. Charles Richard Beall Blvd	DeBary	Very High Risk	96-100	None	
District 6 A-DeBary Substation	79 S CHARLES R BEALL BLVD	DeBary	Very High Risk	96-100	None	
Fire Station 33	75 S. Charles Richard Beall Blvd	DeBary	Very High Risk	96-100	None	
Public Works Facility	199 Barwick Road	DeBary	Very High Risk	96-100	None	
Agriculture Center	3100 E NEW YORK AV	DeLand	High Risk	96-100	None	A
Airport Maintenance Fuel Depot	1777 LANGLEY AV	DeLand	Low Risk	96-100	None	
Airport Maintenance Main Building	1777 LANGLEY AV	DeLand	Low Risk	96-100	None	
Aviation/Special Services	951 SINGLETON DR	DeLand	Low Risk	96-100	None	
Chisholm Center Main Building	520 S CLARA AV	DeLand	Very High Risk	96-100	None	
Community Services - Teal Building	110 W RICH AV	DeLand	Low Risk	96-100	None	
DeLand City Hall	120 S FLORIDA AV	DeLand	Low Risk	96-100	None	
DeLand Civil / Court Services Unit	101 N ALABAMA	DeLand	Low Risk	96-100	None	
DeLand Train Station	2491 OLD NEW YORK AV	DeLand	Low Risk	96-100	None	
District 2	1706 S WOODLAND BLVD	DeLand	Very High Risk	96-100	None	
Env Health Field Office / Admin	121 W RICH AV	DeLand	Low Risk	96-100	None	
Evac Ambulance Station 10	2850 FIREHOUSE RD	DeLand	High Risk	96-100	None	
Evac Ambulance Station 2	1655 E TAYLOR RD	DeLand	Low Risk	96-100	None	
Evac Ambulance Station 5	257 W INTL SPEEDWAY BLVD	DeLand	Low Risk	96-100	None	
Fire Station 81	201 HOWRY AV	DeLand	Low Risk	96-100	None	
Fire Station 82	257 W INTL SPEEDWAY BLVD	DeLand	Low Risk	96-100	None	
Fire Station 83	1655 E TAYLOR RD	DeLand	Low Risk	96-100	None	
FL DOT District 5 Administration Center	719 S WOODLAND BLVD	DeLand	Low Risk	96-100	None	
FL Highway Patrol Troop D District 3	1551 E INTL SPEEDWAY BLVD	DeLand	Low Risk	96-100	None	
FL National Guard - Battery B 1-265	401 S ALABAMA AV	DeLand	Low Risk	96-100	None	
Glenwood 46	920 GLENWOOD RD	DeLand	High Risk	96-100	None	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 3)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Historic Courthouse	125 W NEW YORK AV	DeLand	Very High Risk	96-100	None	
Information Technology	119 W INDIANA AV	DeLand	Very High Risk	96-100	None	
Kepler Ridge 42	1885 N KEPLER RD	DeLand	Very High Risk	96-100	None	
Leigh Matusick Airport Management Center	1000 FLIGHTLINE BLVD	DeLand	Low Risk	96-100	None	
Microcomputers	203 W RICH AV	DeLand	Low Risk	96-100	None	
Parks, Recreation, and Culture	202 N FLORIDA AV	DeLand	Low Risk	96-100	None	
Personnel Suite 62	230 N WOODLAND BLVD	DeLand	Low Risk	96-100	None	
Police Station	219 W HOWRY AV	DeLand	Low Risk	96-100	None	
Public Services Fuel Depot	1112 S GARFIELD AV	DeLand	Very High Risk	96-100	None	
Public Services Mechanics Bay and Sign Shop	1122 S GARFIELD AV	DeLand	Very High Risk	96-100	None	
R&B Barn 1 - NW Complex	2560 W SR 44	DeLand	Low Risk	96-100	None	
Risk Mgmt Suite 250	230 N WOODLAND BLVD	DeLand	Low Risk	96-100	None	
Road & Bridge Sign Shop	300 E NEW HAMPSHIRE AV	DeLand	Very High Risk	96-100	None	
Sanborn Center	751 S ALABAMA AV	DeLand	Low Risk	96-100	None	
So Administration / Central Records	123 W INDIANA AV	DeLand	Low Risk	96-100	None	
Spring Hill Community Resource Center	910 S ADELLE AV	DeLand	Low Risk	96-100	None	
Springs Lakes 32	2850 FIREHOUSE RD	DeLand	High Risk	96-100	None	
St Johns 45	2580 W NEW YORK AV	DeLand	Low Risk	96-100	None	
Stone Street Parks and Recreations Admin Building and Museum	230 N STONE ST	DeLand	Low Risk	96-100	None	
TCK Admin Center - DeLand	123 W INDIANA AV	DeLand	Low Risk	96-100	None	
Volusia County Courthouse	101 N ALABAMA AV	DeLand	Low Risk	96-100	None	
Volusia County Land Acquisition	123 W Indiana Avenue	DeLand	Low Risk	96-100	None	
Windrow Building	1101 S Amelia Ave	DeLand	Very High Risk	96-100	None	
Deleon Springs 41	5007 CENTRAL AV	Deleon Springs	Very High Risk	96-100	None	
Deleon Springs Forestry Station	5458 N US HWY 17	Deleon Springs	High Risk	96-100	None	
Deleon Springs Tower	1276 REYNOLDS RD	Deleon Springs	High Risk	96-100	None	
Community Training (FD)	1362 E LOMBARDY DR	Deltona	Low Risk	96-100	None	
Deltona 65	2983 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Deltona 800 MHz Tower	201 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Deltona City Hall/Municipal Complex	2345 PROVIDENCE BLVD	Deltona	High Risk	96-100	None	
Deltona Water Complex	255 ENTERPRISE RD	Deltona	Low Risk	96-100	None	
District 4 / Civil Daytona	1691 PROVIDENCE BLVD	Deltona	Low Risk	96-100	None	
Evac Ambulance Station 6	1236 SAXON BLVD	Deltona	Low Risk	96-100	None	
Fire Department Logistics Complex	1362 E LOMBARDY DR	Deltona	Low Risk	96-100	None	
Fire Station 61/Administration Building	1685 PROVIDENCE BLVD	Deltona	Low Risk	96-100	None	
Fire Station 62	320 DIAMOND ST	Deltona	Very High Risk	96-100	None	
Fire Station 63	2147 HOWLAND BLVD	Deltona	Very High Risk	96-100	None	
Fire Station 64	236 FT. SMITH BLVD	Deltona	Very High Risk	96-100	None	
Fire Station 65	2983 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Health Department	3151 HOWLAND BLVD	Deltona	High Risk	96-100	None	
Public Works Facility	201 HOWLAND BLVD	Deltona	High Risk	96-100	None	
School Board - Vehicle Maintenance	2101 EUSTACE AV	Deltona	Very High Risk	96-100	None	
Wes Crile Gymnasium	1537 NORBERT TER	Deltona	Low Risk	96-100	None	
800 MHz Tower	135 ARTHUR AV	Edgewater	Very High Risk	101-105	Category 3	
Coronado Point	308 OLD COUNTY ROAD	Edgewater	Very High Risk	101-105	Category 2	
Discovery Days Inst Of Learning	227 N RIDGEWOOD AVE	Edgewater	Very High Risk	101-105	Category 3	
Edgewater City Hall	104 N RIVERSIDE DR	Edgewater	Very High Risk	101-105	Category 2	
Edgewater Police Department	135 E PARK AVE	Edgewater	Very High Risk	101-105	Category 3	
Edgewater Public School	801 S OLD COUNTY ROAD	Edgewater	Very High Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 4)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Edgewater Station 55	106 RHODE ISLAND ST	Edgewater	Very High Risk	101-105	Category 4	
Edgewater Station 57	2628 HIBISCUS DR	Edgewater	High Risk	101-105	Category 3	
Indian River Elementary School	650 ROBERTS ROAD	Edgewater	Low Risk	101-105	Category 4	
Little Explorers Montessori School	410 N RIDGEWOOD AVE	Edgewater	Very High Risk	101-105	Category 3	
Massey Ranch Airpark	635 AIR PARK ROAD	Edgewater	High Risk	101-105	Category 3	
Southeast Volusia Family YMCA	148 W TURGOT AV	Edgewater	Very High Risk	101-105	Category 3	
Indian Mound 34	1700 ENTERPRISE OSTEEN RD	Enterprise	High Risk	96-100	None	
City Hall Annex	1066 Ridgewood Avenue	Holly Hill	Low Risk	101-105	Category 3	
Daytona Beach General Hospital	1360 Ridgewood Avenue	Holly Hill	Low Risk	101-105	Category 3	
Evac East Side Hub - Ambulance Station 1	112 CARSWELL AV	Holly Hill	Low Risk	101-105	Category 3	
Evac Tower	112 CARSWELL AV	Holly Hill	Low Risk	101-105	Category 3	
Holly Hill 96	1020 DAYTONA AV	Holly Hill	Low Risk	101-105	Category 4	
Holly Hill City Hall	1065 RIDGEWOOD AV	Holly Hill	Low Risk	101-105	Category 4	
Holly Hill Police Department	1065 RIDGEWOOD AV	Holly Hill	Low Risk	101-105	Category 4	
Public Works Yard	453 LPG A BLVD	Holly Hill	Low Risk	101-105	Category 3	
R&B Barn 3 - NE Complex	455 WALKER ST	Holly Hill	Low Risk	101-105	Category 3	AE
SICA Hall	1065 Daytona Avenue	Holly Hill	Low Risk	101-105	Category 3	
YMCA	1046 Daytona Avenue	Holly Hill	Low Risk	101-105	Category 4	
Central Fellowship Christian Academy	E KICKLIGHTER RD	Lake Helen	Very High Risk	96-100	None	
Lake Helen City Hall	327 S LAKEVIEW DR	Lake Helen	Very High Risk	96-100	None	
Lake Helen Police Department	493 SOUTH LAKEVIEW DR	Lake Helen	Low Risk	96-100	None	
Lake Helen Station 35	630 W MAIN ST	Lake Helen	Very High Risk	96-100	None	
Volusia Pines Elementary School	500 E KICKLIGHTER ROAD	Lake Helen	Very High Risk	96-100	None	
Lake Harney 37	740 LAKE HARNEY WOODS BLVD	Mims	Low Risk	101-105	Category 4	
Air Traffic Control Tower	2100 Aero Circle	New Smyrna Beach	Low Risk	101-105	Category 3	
Airport Main Office	602 Skyline Dr	New Smyrna Beach	Low Risk	101-105	Category 2	
Babe James Community Center	201 N MYRTLE AV	New Smyrna Beach	Very High Risk	101-105	Category 2	
Coast Guard Station - Ponce Inlet	2999 N PENINSULA AV	New Smyrna Beach	Low Risk	101-105	Category 2	
Community Services - Veterans Services	717 CANAL ST	New Smyrna Beach	Very High Risk	101-105	Category 2	
District 5 / Civil	101 E CANAL ST	New Smyrna Beach	Low Risk	101-105	Category 2	
Evac Ambulance Station 7	534 N DIXIE FREEWAY	New Smyrna Beach	Very High Risk	101-105	Category 2	
Fire Station 50	1400 State Rd 44	New Smyrna Beach	Very High Risk	101-105	Category 2	
Fire Station 51, Emergency Operations Center	3151 State Rd 44	New Smyrna Beach	Low Risk	101-105	None	
Fire Station 52	500 E. 3rd Ave	New Smyrna Beach	Low Risk	101-105	Category 2	
Fire Station 53	238 Industrial Park Ave	New Smyrna Beach	Low Risk	101-105	Category 3	
Health Department	717 CANAL ST	New Smyrna Beach	Very High Risk	101-105	Category 2	
Lifeguard Station	207 BUENOS AIRES ST	New Smyrna Beach	Low Risk	101-105	Category 3	VE
Live Oak Gym	1000 LIVE OAK ST	New Smyrna Beach	Low Risk	101-105	Category 3	
Maintenance operations facility	124 Industrial Park Ave	New Smyrna Beach	Low Risk	101-105	Category 3	
Mosquito Control	1600 AVIATION CENTER PKWY	New Smyrna Beach				
Mosquito Control	801 SOUTH ST	New Smyrna Beach	Low Risk	101-105	Category 3	
New Smyrna Beach City Hall	210 Sams Ave	New Smyrna Beach	Low Risk	101-105	Category 2	
New Smyrna Beach Police Department	246 Industrial Park Ave	New Smyrna Beach	Low Risk	101-105	Category 3	
New Smyrna Beach Site	121 WALLACE RD	New Smyrna Beach	Very High Risk	101-105	Category 2	AE
New Smyrna Station	291 BUENOS AIRES ST	New Smyrna Beach	Low Risk	101-105	Category 3	VE
R&B Barn 4 - SE Complex	530 N DIXIE FREEWAY	New Smyrna Beach	Very High Risk	101-105	Category 2	
South Beach 21	4840 S ATLANTIC AV	New Smyrna Beach	High Risk	101-105	Category 2	
Turnbull 23	1850 PIONEER TR	New Smyrna Beach	Very High Risk	101-105	Category 2	
Volusia County Courthouse Annex	124 N RIVERSIDE DR	New Smyrna Beach	Low Risk	101-105	Category 2	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 5)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Dalphonse Ranch Airport	3533 IRISH LANE	Oak Hill	High Risk	101-105	Category 3	A
Oak Hill Christian Academy	159 N GAINES STREET	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill City Hall	234 S US HWY 1	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill Elementary School	RIDGE ROAD	Oak Hill	Very High Risk	101-105	None	
Oak Hill Police Department / SO	234 S US HWY 1	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill Public Works	234 S US HWY 1	Oak Hill	Very High Risk	101-105	Category 4	
Oak Hill Station 22	213 N US HWY 1	Oak Hill	Low Risk	101-105	Category 3	
Deltona Memorial	1055 Saxon Blvd	Orange City	Low Risk	96-100	None	
Evac West Side Hub - Old Station 31	1970 S VOLUSIA AV	Orange City	Very High Risk	96-100	None	
Industrial Drive Station	259 INDUSTRIAL DRIVE	Orange City	Very High Risk	96-100	None	
Manatee Cove Elementary School	734 W OHIO AVENUE	Orange City	High Risk	96-100	None	
Orange City City Hall	205 E GRAVES AVE	Orange City	Very High Risk	96-100	None	
Orange City Elementary School	555 E UNIVERSITY AVENUE	Orange City	Low Risk	96-100	None	
Orange City Police Department	225 N HOLLY AVE	Orange City	Low Risk	96-100	None	
Orange City Site	1201 S LEAVITT AV	Orange City	Very High Risk	96-100	None	
Orange City Station 67	215 N HOLLY AV	Orange City	Low Risk	96-100	None	
Orange City Station 68	743 HARLEY STRICKLAND BV	Orange City	High Risk	96-100	None	
Orange City University High School	1000 W RHODE ISLAND AVE	Orange City	High Risk	96-100	None	
Orange City Utilities	426 S VOLUSIA AVENUE	Orange City	Very High Risk	96-100	None	
Property Appraisers Office	113 CANAL ST	Orange City	Low Risk	101-105	Category 2	
Property Appraisers Office	2742 ENTERPRISE RD	Orange City	Low Risk	96-100	None	
River Springs Middle School	900 W OHIO AVENUE	Orange City	High Risk	96-100	None	
Tag & Title Office	2744 ENTERPRISE RD	Orange City	Low Risk	96-100	None	
VCFS Logistics	1970 S VOLUSIA AV	Orange City	Very High Risk	96-100	None	
Wava Hall Senior Center	200 N HOLLY AV	Orange City	Very High Risk	96-100	None	
Avante at Ormond Beach	170 NORTH KINGS RD	Ormond Beach	Very High Risk	96-100	Category 3	
Bet Sefer Heritage School	55 N WASHINGTON ST	Ormond Beach	Very High Risk	101-105	Category 3	
Bridgeview Center	350 S RIDGEWOOD AVE	Ormond Beach	Very High Risk	101-105	Category 5	
Calvary Christian Academy	1687 W GRENADA BLVD	Ormond Beach	Low Risk	96-100	None	
Clare Bridge	240 INTERCHANGE BLVD	Ormond Beach	High Risk	96-100	None	
Coquina Center	170 NORTH CENTER ST	Ormond Beach	Very High Risk	101-105	Category 3	
Crown Castle USA	123 N ORCHARD ST	Ormond Beach	Very High Risk	101-105	Category 3	
District 3	1435 US HWY 1 STE D-3	Ormond Beach	Very High Risk	96-100	None	
Evergreen	720 SANTA ANA AVE	Ormond Beach	Very High Risk	101-105	Category 3	
Florida Production Engineering	2 E TOWER CIR	Ormond Beach	Low Risk	96-100	None	
Golden Abbey	1410 HAND AVE	Ormond Beach	Low Risk	96-100	None	
Grace Academy	1060 W GRENADA BLVD	Ormond Beach	Very High Risk	96-100	None	
Grand Villa of Ormond	535 NORTH NOVA RD	Ormond Beach	Very High Risk	96-100	Category 3	
Halifax Plantation 16	3935 OLD DIXIE HWY	Ormond Beach	High Risk	96-100	None	
Halifax Station 13	15 SOUTHLAND RD	Ormond Beach	High Risk	96-100	Category 5	
Hawaiian Tropic (Playtex Mfg)	1190 N US HWY 1	Ormond Beach	Low Risk	96-100	Category 4	
Homac Manufacturing	1 AVIATOR WAY	Ormond Beach	High Risk	96-100	None	
Hudson Tool and Die	1327 US 1 NORTH	Ormond Beach	Very High Risk	96-100	None	
Kozy Korner	605 ORCHARD AVE	Ormond Beach	Very High Risk	101-105	Category 3	
Lowe's	1340 W GRANADA BV	Ormond Beach	High Risk	96-100	None	
NC Control Tower	1665 OCEAN SHORE BLVD	Ormond Beach	No Risk	101-105	Category 3	VE
North Peninsula 14	1716 ATLANTIC AV	Ormond Beach	Very High Risk	101-105	Category 3	
Office Modular - Tomoka State Park	2099 N. Beach Street	Ormond Beach	High Risk	101-105	Category 4	
Ormond Beach City Hall	22 S BEACH ST	Ormond Beach	Very High Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 6)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Ormond Beach Elementary School	100 CORBIN AVENUE	Ormond Beach	Very High Risk	101-105	Category 4	
Ormond Beach Memorial Hospital	305 MEMORIAL MED PWY	Ormond Beach	Low Risk	96-100	None	
Ormond Beach Middle School	151 DOMICILIO AVENUE	Ormond Beach	Very High Risk	101-105	Category 3	
Ormond Beach Municipal Airport	770 AIRPORT ROAD	Ormond Beach	High Risk	96-100	Category 5	
Ormond Beach Police Department	170 W GRANADA BLVD	Ormond Beach	Low Risk	101-105	Category 4	
Ormond Beach Public Works	501 NORTH ORCHARD ST	Ormond Beach	Very High Risk	101-105	Category 3	
Ormond Beach Station 91	364 S ATLANTIC AV	Ormond Beach	Low Risk	101-105	Category 3	
Ormond Beach Station 92	189 S NOVA RD	Ormond Beach	Very High Risk	96-100	None	
Ormond Beach Station 93	300 WILMETTE AVE	Ormond Beach	Low Risk	101-105	Category 3	
Ormond Beach Station 94	2301 AIRPORT RD	Ormond Beach	High Risk	96-100	None	
Ormond Control Tower	301 CARDINAL DR	Ormond Beach	No Risk	101-105	Category 2	VE
Ormond In The Pines	101 CLYDE MORRIS BV	Ormond Beach	Very High Risk	96-100	None	
Ormond Station	301 CARDINAL DR	Ormond Beach	No Risk	101-105	Category 2	VE
Osceola Elementary School	100 OSCEOLA AVENUE	Ormond Beach	Low Risk	101-105	Category 3	
Pace Center For Girls	208 CENTRAL AVENUE	Ormond Beach	Very High Risk	101-105	Category 3	
Pathways Elementary School	2100 AIRPORT ROAD	Ormond Beach	High Risk	96-100	None	
Pine Trail Elementary School	300 AIRPORT ROAD	Ormond Beach	High Risk	96-100	None	
Prestige Gunit	1229 N US HWY 1	Ormond Beach	Very High Risk	96-100	None	
Restroom/Picnic Shelter -Nocorroco-Tomoka	2099 N BEACH STREET	Ormond Beach	High Risk	101-105	Category 4	
Rinker Materials Corporation	350 W GRANADA BLVD	Ormond Beach	Low Risk	101-105	Category 3	AE
Riverbend Academy	2080 W GRENADA BLVD	Ormond Beach	Low Risk	96-100	None	
Seasons By Riviera	515 TOMOKA AVE	Ormond Beach	Very High Risk	101-105	Category 3	
Signature Healthcare	103 CLYDE MORRIS BV	Ormond Beach	Very High Risk	96-100	None	
Southland Suites of Ormond	550 WILMETTE AVE	Ormond Beach	Very High Risk	101-105	Category 3	AE
St Brendan School	1000 OCEAN SHORE BV	Ormond Beach	Very High Risk	101-105	Category 3	
St James Episcopal School	38 S HALIFAX DRIVE	Ormond Beach	Very High Risk	101-105	Category 4	
Sunrise Aviation	740 AIRPORT RD	Ormond Beach	High Risk	96-100	Category 5	
Temple Beth Elementary School	579 N NOVA ROAD	Ormond Beach	High Risk	96-100	Category 4	
Tomoka Elementary School	999 OLD TOMOKA ROAD	Ormond Beach	Very High Risk	96-100	None	
Tymber Creek Utilities	1951 W GRENADA BLVD	Ormond Beach	Very High Risk	96-100	None	
Visitor Program Building - Tomoka Springs	2099 N BEACH STREET	Ormond Beach	High Risk	101-105	Category 4	
Wellington Place By the Sea	1050 OCEAN SHORE BV	Ormond Beach	Very High Risk	101-105	Category 4	
Osteen 36	180 N SR 415	Osteen	High Risk	96-100	None	
R&B Barn 2 - SW Complex	200 N SR 415	Osteen	High Risk	96-100	None	
R&B Barn 2 - Votran Parking	200 N SR 415	Osteen	High Risk	96-100	None	
Pierson	816 HAGSTROM RD	Pierson	High Risk	96-100	None	
Pierson City Hall	106 N CENTER ST	Pierson	Very High Risk	96-100	None	
Pierson Elementary Replacement	700 N Center St	Pierson	Low Risk	96-100	None	
Pierson Elementary School	1 W 1ST AVENUE	Pierson	Very High Risk	96-100	None	
Pierson Municipal Airport	106 N CENTER STREET	Pierson	Very High Risk	96-100	None	
Pierson Station 44	132 N FOUNTAIN DR	Pierson	Very High Risk	96-100	None	
Rima Ridge 18	500 RODEO RD	Pierson	Low Risk	96-100	None	
Taylor Middle-High School	100 E WASHINGTON AVE	Pierson	Low Risk	96-100	None	
Fire Department Headquarters	4860 S Peninsula Ave	Ponce Inlet	High Risk	101-105	Category 2	
Inlet Harbor Hazmat Facility	133 Inlet Harbor Road	Ponce Inlet	No Risk	101-105	Category 1	AE
Marine Science Center	5000 S ATLANTIC AV	Ponce Inlet	High Risk	101-105	Category 2	
Ponce Inlet 78	4680 S PENINSULA DR	Ponce Inlet	High Risk	101-105	Category 2	
Ponce Inlet Control Tower	ON BEACH	Ponce Inlet	Low Risk	101-105	Category 3	VE
Ponce Inlet Police Department	4301 S PENINSULA DR	Ponce Inlet	Low Risk	101-105	Category 2	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 7)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Ponce Inlet Town Hall	4300 S Atlantic Ave	Ponce Inlet	Low Risk	101-105	Category 4	
Academy of Martial Arts, Inc.	220 CHARLES ST	Port Orange	Low Risk	101-105	Category 1	AE
Adult Activity Center	4790 RIDGEWOOD AV	Port Orange	Low Risk	101-105	Category 2	
Atlantic High School	1250 REED CANAL ROAD	Port Orange	Very High Risk	101-105	None	
Bayside Care Center	3778 MAPLE GROVE CT.	Port Orange	Very High Risk	101-105	None	
Brookdale Yorktowne (formerly Emeritus at Port Orange)	1675 Dunlawton Ave.	Port Orange	Very High Risk	101-105	None	
Canal View Rest Home	864 CANALVIEW BLVD.	Port Orange	Low Risk	101-105	Category 2	
City Gymnasium - Parks Administration	4655 CITY CENTER CIR	Port Orange	Very High Risk	101-105	None	
Commonwealth Christian Academy	5231 S NOVA ROAD	Port Orange	Low Risk	101-105	Category 3	
Coquina Cove Assisted Living	3739 SUNRISE OAKS DR.	Port Orange	High Risk	101-105	None	
Country Manor Assisted Living & Retirement Home LL	1152 OLD HAMMOCK RD.	Port Orange	Very High Risk	101-105	Category 4	
COUNTRYSIDE CARE CENTER	710 PINE FOREST TRL.	Port Orange				
Countryside Lakes	941 Village Trail	Port Orange	Low Risk	101-105	Category 4	
Creekside Middle School	6801 AIRPORT ROAD	Port Orange	Low Risk	101-105	None	
Cypress Creek Elementary School	6100 S WILLIAMSON BLVD	Port Orange	High Risk	101-105	Category 4	
D'Manila Garden, Inc.	316 Moss Avenue	Port Orange	Low Risk	101-105	Category 3	
Fran's Elderly Care	1309 ALCORN RD.	Port Orange	Very High Risk	101-105	None	
Fuel Site - Tomoka Landfill	1990 TOMOKA FARMS RD	Port Orange	Low Risk	101-105	None	
Grace Manor Assisted Living & Memory Care	1321 Herbert Street	Port Orange	Very High Risk	101-105	None	
Halifax Health Medical Center - Port Orange	1041 Dunlawton Ave	Port Orange	Low Risk	101-105	Category 3	
Harbour Oaks Elderly Care	158 FARMBROOK AVE.	Port Orange	Low Risk	101-105	Category 3	
Horizon Elementary School	4751 HIDDEN LAKE DR	Port Orange	Very High Risk	101-105	None	
Manila Home Care	5463 LANDIS AVE.	Port Orange	Low Risk	101-105	Category 2	
Open Arms ALF Care Center	401 ORANGE AVE.	Port Orange	Low Risk	101-105	Category 3	
Pathways Early Learning Center	3749 S NOVA ROAD	Port Orange	Low Risk	101-105	Category 3	
Pheasant Paradise	799 Pheasant Run Court	Port Orange	Very High Risk	101-105	None	
Port Orange City Hall	1000 CITY CENTER CIR	Port Orange	Very High Risk	101-105	None	
Port Orange Elementary School	402 DUNLAWTON AVENUE	Port Orange	Low Risk	101-105	Category 3	
Port Orange Endoscopy & Surgery Ctr Inc.	1185 Dunlawton Avenue	Port Orange	Very High Risk	101-105	Category 4	
Port Orange Family YMCA	4701 CITY CENTER PKWY	Port Orange	Very High Risk	101-105	None	
Port Orange Nursing and Rehab Center	5600 Victoria Gardens Blvd.	Port Orange	Very High Risk	101-105	None	
Port Orange Police Department	4545 CLYDE MORRIS	Port Orange	Very High Risk	101-105	None	
Port Orange Public Works	407 VIRGINIA AV	Port Orange	Low Risk	101-105	Category 3	
Port Orange Regional Communication Center	1395 DUNLAWTON AV	Port Orange	Very High Risk	101-105	None	
Port Orange Station 71	4200 RIDGEWOOD AVE	Port Orange	Low Risk	101-105	Category 2	
Port Orange Station 72	6027 CENTRAL PARK BLVD	Port Orange	Very High Risk	101-105	Category 3	
Port Orange Station 73	1090 CITY CENTER BLVD	Port Orange	Low Risk	101-105	None	
Port Orange Station 74	6701 AIRPORT RD	Port Orange	Low Risk	101-105	None	
Port Orange Station 75	1701 TOWN WEST BLVD	Port Orange	High Risk	101-105	None	
Portside Care Center	3832 LONG GROVE LANE	Port Orange	Very High Risk	101-105	None	
Senior Center	3738 HALIFAX DR	Port Orange	Low Risk	101-105	Category 2	AE
Silver Sands Middle School	1300 HERBERT STREET	Port Orange	Very High Risk	101-105	Category 5	
Spruce Creek 12	1979 TAYLOR RD	Port Orange	High Risk	101-105	Category 4	
Spruce Creek Assisted Living Facility, Inc.	5953 Broken Bow Lane	Port Orange	Very High Risk	101-105	Category 4	
Spruce Creek Elementary School	642 TAYLOR ROAD	Port Orange	Very High Risk	101-105	Category 4	
Spruce Creek High School	801 TAYLOR ROAD	Port Orange	Very High Risk	101-105	None	
Station WNTV936	4801 CITY CENTER DR	Port Orange	Very High Risk	101-105	None	
Sterling House of Port Orange	955 Village Trail	Port Orange	Low Risk	101-105	Category 4	
Sugar Mill Elementary School	1101 CHARLES STREET	Port Orange	Low Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities (Page 8)

Name of Facility	Address	Jurisdiction/Place	Fire Zone	Wind Zone	Surge Zone	Flood Zone
Sweetwater Elementary School	5800 VICTORIA GARDENS BV	Port Orange	Very High Risk	101-105	None	
Twin Acres Rest Home	1155 BUTTERMILK LN.	Port Orange	Very High Risk	101-105	None	
WORC, Inc.	1231 Edna Drive	Port Orange	Very High Risk	101-105	None	
AT&T Cellular One Port Orange	1133 3 STREET	South Daytona	Low Risk	101-105	Category 3	
Intl Academy of Hair Design	2550 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	
James Park Youth Activity Center	1700 JAMES ST	South Daytona	Low Risk	101-105	Category 3	
Piggotte Community Center	504 BIG TREE RD	South Daytona	Low Risk	101-105	Category 3	
Richard Milburn Academy East	1025 MASON AVENUE	South Daytona	Very High Risk	101-105	Category 3	
Rinker Materials Corp - Daytona	2900 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 2	
South Daytona City Hall	1672 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	
South Daytona Elementary School	600 ELIZABETH PLACE	South Daytona	Low Risk	101-105	Category 2	
South Daytona Fire Station	1672 S RIDGEWOOD AV	South Daytona	Low Risk	101-105	Category 3	
South Daytona Fire Station NO 2 / Warehosue	2107 BRIAN AV	South Daytona	Low Risk	101-105	Category 2 A	
South Daytona Police Department	1672 S RIDGEWOOD AV	South Daytona	Low Risk	101-105	Category 3	
South Daytona Station 98	1672 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	
Votran	950 BIG TREE RD	South Daytona	Low Risk	101-105	Category 2	
Warner Christian Academy School	1730 S RIDGEWOOD AVE	South Daytona	Low Risk	101-105	Category 3	

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Critical Facilities by Jurisdiction

The table below is a count of critical facilities separated by jurisdiction within the county. The status of incorporation of the jurisdiction is also listed.

Critical Facilities By Jurisdiction		
Jurisdiction	Number	Incorporation Status
Daytona Beach	65	Incorporated
Daytona Beach Shores	8	Incorporated
DeBary	6	Incorporated
DeLand	44	Incorporated
DeLeon Springs	3	Census Designated Place
Deltona	17	Incorporated
Edgewater	12	Incorporated
Enterprise	1	Census Designated Place
Holly Hill	11	Incorporated
Lake Helen	5	Incorporated
Mims	1	Unincorporated Community
New Smyrna Beach	25	Incorporated
Oak Hill	7	Incorporated
Orange City	18	Incorporated
Ormond Beach	56	Incorporated
Osteen	3	Unincorporated Community
Pierson	8	Incorporated
Ponce Inlet	7	Incorporated
Port Orange	52	Incorporated
South Daytona	14	Incorporated

Critical Facilities within Surge Zones

The following table is a count of all critical facilities within the county that would be at risk of flooding based on the category of the potential hurricane.

Critical Facilities Within Surge Zones	
Surge Status	Number of Facilities
Within Category 1	4
Within Category 2	39
Within Category 3	80
Within Category 4	39
Within Category 5	5
Not Within Any Storm Surge	193

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Water and Sewage Treatment Facilities

The following pages list the water and sewage treatment facilities located in Volusia County, along with their respective hazard zones.

Facility Name	Latitude	Longitude	Type	Flood Zone	Fire Zone	Storm Surge Zone	Wind Zone
FLO025984	29.195	81.001	Sewage Treatment	Zone AE	No Risk	Category 1	101-105 mph
FLA011177	28.924	80.872	Sewage Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
FLO020532	29.288	81.073	Sewage Treatment	Zone AE	High Risk	Category 4	101-105 mph
FLA011128	28.908	81.325	Sewage Treatment	X - 500 yr	High Risk	None	96-100 mph
FLA011118	28.929	81.286	Sewage Treatment	X - 500 yr	High Risk	None	96-100 mph
FLA011179	29.25	81.117	Sewage Treatment	X - 500 yr	Low Risk	None	96-100 mph
FLO020559	29.136	80.994	Sewage Treatment	X - 500 yr	Low Risk	Category 3	101-105 mph
FLO020133	29.03	80.917	Sewage Treatment	Zone AE	Low Risk	Category 2	101-105 mph
FLO027677	29.24	81.044	Sewage Treatment	Zone AE	Low Risk	Category 4	101-105 mph
FLA011139	29.175	81.111	Sewage Treatment	X - 500 yr	Low Risk	None	101-105 mph
FLA011109	29.083	81.043	Sewage Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
FLO024546	28.874	81.251	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLA011193	29.265	81.127	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLA011188	29.383	81.083	Sewage Treatment	X - 500 yr	Very High Risk	Category 5	101-105 mph
FLO021431	28.973	80.915	Sewage Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
FLA011132	29.083	81.325	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLO020303	29.009	81.298	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
FLA011121	28.916	81.25	Sewage Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.922	81.19	Water Treatment	Zone AE	No Risk	None	96-100 mph
SEM. CO/HEATHROW SYS	28.786	81.012	Water Treatment	Zone AE	No Risk	None	101-105 mph
SEM. CO/HEATHROW SYS	28.786	81.012	Water Treatment	Zone AE	No Risk	None	101-105 mph
MCINNIS ELEMENTARY	29.127	81.352	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
LAKE BERESFORD	29.01	81.345	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.897	81.311	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.897	81.311	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.903	81.29	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.903	81.29	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.953	81.272	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.957	81.269	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.957	81.269	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.929	81.254	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.933	81.25	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.933	81.25	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
DELTONA NORTH	28.941	81.244	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
DELTONA NORTH	28.941	81.244	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.939	81.224	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
LAKE HELEN WATER DEP	28.984	81.222	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.941	81.18	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.941	81.18	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
KOVE ESTATES ASSOCIA	28.845	81.173	Water Treatment	Zone A	High Risk	None	96-100 mph
TOMOKA VIEW ESTATES	29.263	81.129	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
TOMOKA VIEW ESTATES	29.263	81.129	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SCOTTISH INN	29.333	81.127	Water Treatment	X - 500 yr	High Risk	None	96-100 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
SUGAR MILL COUNTRY C	29.04	80.978	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph
NEW SMYRNA BEACH, CI	28.994	80.962	Water Treatment	X - 500 yr	High Risk	Category 5	101-105 mph

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Water and Sewage Treatment Facilities, Page 2

Facility Name	Latitude	Longitude	Type	Flood Zone	Fire Zone	Storm Surge Zone	Wind Zone
HACIENDA DEL RIO	28.925	80.886	Water Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.925	80.886	Water Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.925	80.886	Water Treatment	X - 500 yr	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.927	80.88	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.927	80.88	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.927	80.88	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.926	80.876	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.926	80.876	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
HACIENDA DEL RIO	28.926	80.876	Water Treatment	Zone A	High Risk	Category 4	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
SOUTH WATER FRONT PA	28.908	80.87	Water Treatment	X - 500 yr	High Risk	Category 3	101-105 mph
CAMP WINONA	29.179	81.341	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
BLUE SPRINGS STATE P	28.952	81.335	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.032	81.324	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.038	81.319	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND/BRANDYWINE	29.075	81.315	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.031	81.309	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.021	81.299	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
DELAND, CITY OF	29.02	81.299	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.915	81.296	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SHERWOOD MEDICAL IND	29.06	81.265	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SHERWOOD MEDICAL IND	29.06	81.265	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
LAKE HELEN WATER DEP	28.995	81.245	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
QUALITY INN (SAVE IN	29.019	81.238	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.896	81.236	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.896	81.236	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.896	81.236	Water Treatment	X - 500 yr	Low Risk	None	96-100 mph
HANDY WAY #3321/SPAR	29.133	81.2	Water Treatment	Zone A	Low Risk	None	96-100 mph
HANDY WAY #3319/OCAL	29.133	81.2	Water Treatment	Zone A	Low Risk	None	96-100 mph
A&M DISCOUNT BEVERAG	29.133	81.2	Water Treatment	Zone A	Low Risk	None	96-100 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
DAYTONA BEACH, CITY	29.172	81.116	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
COLUMBIA ELEMENTARY	28.86	81.103	Water Treatment	Zone A	Low Risk	None	96-100 mph
DAYTONA BEACH, CITY	29.189	81.074	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
HOLLY HILL, CITY OF	29.24	81.044	Water Treatment	Zone AE	Low Risk	Category 4	101-105 mph
SOUTH DAYTONA, CITY O	29.199	81.043	Water Treatment	X - 500 yr	Low Risk	Category 4	101-105 mph
SPRUCE CREEK REST AR	29.088	81.018	Water Treatment	X - 500 yr	Low Risk	Category 3	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph
EDGEWATER, CITY OF	28.964	80.96	Water Treatment	X - 500 yr	Low Risk	None	101-105 mph

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Water and Sewage Treatment Facilities, Page 3

Facility Name	Latitude	Longitude	Type	Flood Zone	Fire Zone	Storm Surge Zone	Wind Zone
TOWN OF PIERSON/OP.B	29.241	81.465	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
MEADOWLEA ON THE RIV	28.839	81.333	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
MEADOWLEA ON THE RIV	28.839	81.333	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND/HOLIDAY HILLS	29	81.319	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND/WOODLAND MANO	29.091	81.315	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.952	81.308	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.952	81.308	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.952	81.308	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.911	81.307	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.913	81.305	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND, CITY OF	29.027	81.305	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
WEST VOLUSIA INTERCO	28.883	81.3	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
DELAND, CITY OF	29.035	81.29	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
JOHN KNOX VILLAGE	28.942	81.283	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
ORANGE CITY UTILITIE	28.94	81.274	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.9	81.27	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.9	81.27	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.902	81.258	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.902	81.258	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.905	81.256	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.923	81.243	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.883	81.233	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
LAKE HELEN WATER DEP	28.979	81.229	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.882	81.203	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
SOUTHERN STATES UTIL	28.882	81.203	Water Treatment	X - 500 yr	Very High Risk	None	96-100 mph
TYMBER CREEK UTILITI	29.265	81.126	Water Treatment	X - 500 yr	Very High Risk	Category 5	96-100 mph
TYMBER CREEK UTILITI	29.265	81.126	Water Treatment	X - 500 yr	Very High Risk	Category 5	96-100 mph
TYMBER CREEK UTILITI	29.264	81.126	Water Treatment	Zone AE	Very High Risk	Category 4	96-100 mph
TYMBER CREEK UTILITI	29.264	81.126	Water Treatment	Zone AE	Very High Risk	Category 4	96-100 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
ORMOND BEACH, CITY O	29.278	81.061	Water Treatment	X - 500 yr	Very High Risk	Category 4	101-105 mph
SPRUCE CREEK FLY IN	29.081	81.045	Water Treatment	X - 500 yr	Very High Risk	Category 5	101-105 mph
SPRUCE CREEK FLY IN	29.081	81.045	Water Treatment	X - 500 yr	Very High Risk	Category 5	101-105 mph
COLONY IN THE WOODS	29.141	81.028	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
PORT ORANGE, CITY OF	29.136	81.027	Water Treatment	X - 500 yr	Very High Risk	None	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
TERRA MAR VILLAGE	28.911	80.865	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
INDIAN HARBOR EST.	28.901	80.861	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph
INDIAN HARBOR EST.	28.901	80.861	Water Treatment	X - 500 yr	Very High Risk	Category 3	101-105 mph

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

State Facilities Within Flood Zones

The following table lists the state facilities located within the VE and A flood zones within Volusia County, Florida.

Facility Name	Facility Type	Address	City	Floodzone
Ashby Forestry Site- Fire Tower - D12	Agricultural	1695 PELL ROAD	Osteen	A
Academic Hall	Agricultural	3000 Palm Coast Parkway Southeast	Palm Coast	AE
Classroom Reloc.	Agricultural	3000 Palm Coast Parkway Southeast	Palm Coast	AE
Laboratory Reloc.	Agricultural	940 Tenth Street	New Smyrna Beach	AE
Student Services Center	Agricultural	940 Tenth Street	New Smyrna Beach	AE
Bathhouse - DeLeon Springs SP	Other	601 PONCE DELEON BLVD	De Leon Springs	AE
Cabin - Hontoon Island SP	Other	2309 RIVER RIDGE ROAD	Deland	AE
Concession-Office Hontoon Island SP	Other	Not Listed	Deland	AE
Concession-Visitor Center Meeting Rooms	Other	601 PONCE DELEON BLVD	De Leon Springs	AE
Old Spanish Sugar Mill	Other	601 PONCE DELEON BLVD	De Leon Springs	AE
Restroom Hontoon Island SP	Other	2309 RIVER RIDGE ROAD	Deland	AE
Restroom Hontoon Island SP	Other	2309 RIVER RIDGE ROAD	Deland	AE
SJR Cruises Canoe Rental - Blue Spring State Park	Other	2100 W. FRENCH AVE	Orange City	AE
Storage - Hontoon Island State Park - DeLand	Other	2309 RIVER RIDGE ROAD	Deland	AE
Visitor Program Building - Tomoka Springs	Other	2099 N BEACH STREET	Ormond Beach	AE
Fifth District Court of Appeal	Office	300 South Beach Street	Daytona Beach	AE
Office Modular - Tomoka State Park	Office	2099 N. Beach Street	Ormond Beach	AE
Tiger Bay State Forest Headquarters- D10- Daytona	Office	4316 WEST INTERNATIONAL SPEEDWAY BLVD.	Daytona Beach	A
Main Building	Penal	3601 US Highway 92	Daytona Beach	A
Multi-Purpose	Penal	1001 W. HWY 98	Apalachicola	A
Pavilion-Hobby Craft	Penal	3601 US Highway 92	Daytona Beach	A
Plant-Sewage Treatment	Penal	3601 US Highway 92	Daytona Beach	A
Shed-Water Pump	Penal	3601 US Highway 92	Daytona Beach	A
Storage (Property)	Penal	3601 US Highway 92	Daytona Beach	A
Storage (Tools)	Penal	3601 US Highway 92	Daytona Beach	A
Storage (Toxic Material)	Penal	3601 US Highway 92	Daytona Beach	A
Volusia RJDC - Detention-Jac	Penal	3840 OLD DELAND ROAD	Daytona Beach	A
Work Release Center	Penal	3601 US Highway 92	Daytona Beach	A
Ashby Forestry Site- Residence - D10	Residential	1695 PELL ROAD	Osteen	A
Building #1 - Hawk	Residential	1725 FIFTH STREET	Daytona Beach	AH
Building #2 - Eagle	Residential	1725 FIFTH STREET	Daytona Beach	AH
Ranger Residence - DeLeon Springs SP	Residential	601 PONCE DELEON BLVD.	De Leon Springs	AE
Ashby Forestry Site- Restroom/Storage- D12	Unconditioned Storage	1625 PELL ROAD	Osteen	A
Carport - Parking Lot	Unconditioned Storage	2309 River Ridge Road	Deland	AE
Pavilion-Picnic - Hontoon Island SP	Unenclosed Structure	2309 RIVER RIDGE ROAD	Deland	AE
Restroom/Picnic Shelter -Nocorroco-Tomoka	Unenclosed Structure	2099 N BEACH STREET	Ormond Beach	AE
Shed-Pole Barn - D10 - Daytona Beach	Unenclosed Structure	4316 WEST INTERNATIONAL SPEEDWAY BLVD.	Daytona Beach	A
Shop/Equip Shed - Hontoon Island SP	Utility	2309 RIVER RIDGE ROAD	Deland	AE
Storage - DeLeon Springs	Utility	601 PONCE DELEON BLVD	De Leon Springs	AE
Storage (Flammable) - Hontoon Island SP	Utility	2309 RIVER RIDGE ROAD	Deland	AE
Tiger Bay State Forest Headquarters- Pumphouse-D10	Utility	4316 WEST INTERNATIONAL SPEEDWAY BLVD.	Daytona Beach	A
Volusia RJDC - Maintenance Shed	Utility	3840 OLD DELAND ROAD	Daytona Beach	A
Volusia RJDC - Shed/Generator	Utility	3840 OLD DELAND ROAD	Daytona Beach	A
ARNG Vehicle Maint	Workshop	405 S. BASIN STREET	Daytona Beach	AE
Crew DOT	Workshop	1651 KEPLER RD	Deland	A

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations by Jurisdiction

Facility Name	Address	Jurisdiction
None Provided	2402 W INTL SPEEDWAY BLVD	Daytona Beach
None Provided	303 FENTRESS BLVD	Daytona Beach
None Provided	110 EXECUTIVE DR	Daytona Beach
None Provided	122 MUIRFIELD DR	Daytona Beach
None Provided	278 FENTRESS BLVD	Daytona Beach
None Provided	270 INDIGO DR	Daytona Beach
None Provided	593 N WILLIAMSON BLVD	Daytona Beach
None Provided	598 FENTRESS BLVD	Daytona Beach
None Provided	321 BROWN PELICAN DR	Daytona Beach
None Provided	803 PELICAN BAY DR	Daytona Beach
None Provided	310 YORKTOWNE DR	Daytona Beach
None Provided	1198 PINE ST	Daytona Beach
None Provided	2040 BEVILLE RD	Daytona Beach
None Provided	115 FRANCES DR	Daytona Beach
None Provided	1307 BEVILLE RD	Daytona Beach
None Provided	1500 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1352 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1390 S NOVA RD	Daytona Beach
None Provided	1105 BEVILLE RD	Daytona Beach
None Provided	126 DIANNA DR	Daytona Beach
K2D31651	165 OAK TREE CIR	Daytona Beach
None Provided	600 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1612 RICHARD PETTY BLVD	Daytona Beach
None Provided	1181 INDIAN LAKE RD	Daytona Beach
523584772	507 N CLYDE MORRIS BLVD	Daytona Beach
None Provided	1700 DUNN AV	Daytona Beach
None Provided	301 WILSON AV	Daytona Beach
None Provided	326 PARKWAY ST	Daytona Beach
None Provided	923 MASON AV	Daytona Beach
None Provided	1 FLAGG ST	Daytona Beach
None Provided	1296 3RD ST	Daytona Beach
None Provided	1694 3RD ST	Daytona Beach
None Provided	1101 9TH ST	Daytona Beach
None Provided	739 LOOMIS AV	Daytona Beach
None Provided	395 N BEACH ST	Daytona Beach
None Provided	331 FAIRVIEW AV	Daytona Beach
None Provided	210 N SEGRAVE ST	Daytona Beach
None Provided	201 MAGNOLIA AV	Daytona Beach
None Provided	703 N BEACH ST	Daytona Beach
None Provided	1025 BEL AIRE DR	Daytona Beach
None Provided	104 UNIVERSITY BLVD	Daytona Beach
None Provided	433 AUBURN DR	Daytona Beach
None Provided	101 HARTFORD AV	Daytona Beach
16-07894-K	1392 WRIGHT ST	Daytona Beach
None Provided	1808 MASON AV	Daytona Beach
None Provided	503 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	1011 DOWNEY AV	Daytona Beach
None Provided	121 BASIN ST	Daytona Beach
None Provided	403 BASIN ST	Daytona Beach
None Provided	501 BOSTWICK AV	Daytona Beach
None Provided	103 E ORANGE AV	Daytona Beach
POWER SOURCE FOR LS	101 E MAGNOLIA AV	Daytona Beach
None Provided	30 GOODALL AV	Daytona Beach

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
None Provided	322 REVILO BLVD	Daytona Beach
None Provided	859 MALEY ST	Daytona Beach
None Provided	13 S OCEAN AV	Daytona Beach
None Provided	510 ORA ST	Daytona Beach
None Provided	10 FOUNTAINEBLEAU CIR	Daytona Beach
None Provided	708 WASHINGTON ST	Daytona Beach
None Provided	219 MARION ST	Daytona Beach
None Provided	247 N MARTIN LUTHER KING BLVD	Daytona Beach
6" flange with Bypass inst. 01/2014	386 EUCLID AV	Daytona Beach
None Provided	1700 HOPE DR	Daytona Beach
None Provided	1908 1/2 SUNNYPALM DR	Daytona Beach
None Provided	1317 1/2 AVENUE D	Daytona Beach
None Provided	690 WELLINGTON STATION BLVD	Daytona Beach
None Provided	1331 HAND AV	Daytona Beach
None Provided	3098 W INTL SPEEDWAY BLVD	Daytona Beach
None Provided	1210 BELLEVUE AV	Daytona Beach
None Provided	1608 N WILLIAMSON BLVD	Daytona Beach
None Provided	1790 TECHNOLOGY BLVD	Daytona Beach
None Provided	647 SHADY PL	Daytona Beach
797951	1371 S PALMETTO AV	Daytona Beach
None Provided	2203 W INTL SPEEDWAY BLVD	Daytona Beach
None Provided	553 S MARTIN LUTHER KING BLVD	Daytona Beach
None Provided	790 TOWNSEND AV	Daytona Beach
None Provided	829 WASHINGTON ST	Daytona Beach
None Provided	200 SEA DUCK DR	Daytona Beach
None Provided	843 GATEPARK DR	Daytona Beach
None Provided	1700 HOPE DR	Daytona Beach
None Provided	599 SEA DUCK DR	Daytona Beach
None Provided	1551 ROOSEVELT BLVD	Daytona Beach
None Provided	577 CHAMPIONS DR	Daytona Beach
None Provided	2912 BELLEVUE RD	Daytona Beach
None Provided	939 CHAMPIONS DR	Daytona Beach
None Provided	1328 INDIAN LAKE RD	Daytona Beach
None Provided	1471 CORNERSTONE BLVD	Daytona Beach
None Provided	250 TOURNAMENT DR	Daytona Beach
None Provided	113 TUSCANY BEND ST	Daytona Beach
None Provided	301 INDUSTRIAL PKWY	Daytona Beach
None Provided	3879 TIGER BAY RD	Daytona Beach
None Provided	1170 RED JOHN RD	Daytona Beach
None Provided	40 PERFECT DR	Daytona Beach
None Provided	1184 N TOMOKA FARMS RD	Daytona Beach
None Provided	1500 N TOMOKA FARMS RD	Daytona Beach
None Provided	2448 MASON AV	Daytona Beach
None Provided	2021 DUNN AV	Daytona Beach
None Provided	308 GRAND PRESERVE WAY	Daytona Beach
None Provided	2024 STRICKLAND RANGE RD	Daytona Beach
None Provided	2629 LPG BLVD	Daytona Beach
None Provided	3962 LPG BLVD	Daytona Beach
None Provided	620 HOLLY ST	Daytona Beach
None Provided	100 LAKESIDE PROFESSIONAL BLVD	Daytona Beach
None Provided	128 BOTEFUHR AV	Daytona Beach
None Provided	148 BOYNTON BLVD	Daytona Beach
None Provided	2328 CRESCENT RIDGE RD	Daytona Beach

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
None Provided	175 SEA SPRAY ST	Daytona Beach
None Provided	2730 DACH AV	Daytona Beach
None Provided	16 JEFFERSON LANDING	Daytona Beach
None Provided	2063 S HALIFAX DR	Daytona Beach
None Provided	2206 1/2 S PENINSULA DR	Daytona Beach
None Provided	16 ELIZABETH LN	Daytona Beach
None Provided	2251 S HALIFAX DR	Daytona Beach
None Provided	2431 DODGE DR	Daytona Beach
None Provided	12 GRANVILLE CIR	Daytona Beach
None Provided	310 INTERNATIONAL GOLF DR	Daytona Beach
None Provided	275 BAYBERRY LAKES BLVD	Daytona Beach
None Provided	481 BAYBERRY LAKES BLVD	Daytona Beach
16-0000-A	1 SHADY PL	Daytona Beach
None Provided	100 CINDERBERRY LN	Daytona Beach
None Provided	221 N BEACH ST	Daytona Beach
None Provided	133 CATRIONA DR	Daytona Beach
None Provided	125 GRANDE LAKE DR	Daytona Beach
None Provided	716 WILDER BLVD	Daytona Beach
None Provided	1853 S CLYDE MORRIS BLVD	Daytona Beach
None Provided	764 N TOMOKA FARMS RD	Daytona Beach
None Provided	325 N BEACH ST	Daytona Beach
None Provided	851 CHAMPIONS DR	Daytona Beach
None Provided	2217 MASON AV	Daytona Beach
None Provided	301 N TOMOKA FARMS RD	Daytona Beach
Tuscany Woods Phase 2	446 TUSCANY CHASE DR	Daytona Beach
COUNTY	None Provided	Daytona Beach
COUNTY	None Provided	Daytona Beach
COUNTY	PRINCE OF PEACE CHURCH	Daytona Beach
None Provided	345 MEMORIAL MEDICAL PKWY	Daytona Beach
COUNTY	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
PRIVATE	None Provided	Daytona Beach
OLD-LS 29 NOW PRIVATELY OWNED BY DIS	DAYTONA INTERNATIONAL SPEEDWAY	Daytona Beach
PRIVATE	None Provided	Daytona Beach
None Provided	1608 N CLYDE MORRIS BLVD	Daytona Beach
PRIVATE	LPGA BLVD (& JIMMY ANN DRIVE)	Daytona Beach
PRIVATE	Life Mobile Home Park	Daytona Beach
PRIVATE	960 S Williamson Blvd	Daytona Beach
None Provided	1613 FLOMICH AVE	Daytona Beach
None Provided	126 E Orange Ave	Daytona Beach
PRIVATE	DIS - Turn 1	Daytona Beach
PRIVATE BACK-US FOR LS-529	EMERGENCY PUMP STATION	Daytona Beach
CONNECTS MH 529-27 TO MH 28, 29 & 30	DAYTONA INTERNATIONAL SPEEDWAY	Daytona Beach
None Provided	882 TOURNAMENT DRIVE	Daytona Beach
IN PLANT PUMP STATION #1	3651 LPGA BLVD	Daytona Beach
PRIVATE HOMA MODEL#GRP26S/3/C	984 N WILLIAMSON BLVD	Daytona Beach
Whitewood	1145 Whitewood	Deltona
Antilles	0 Antilles Terrace	Deltona
Deltona Plaza	Deltona Plaza	Deltona
Fountainhead	1192 Deltona Blvd	Deltona
Motel	0 Welcome Cen. Dr.	Deltona

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
Bristol Ct	255 Enterprise Road	Deltona
Waycross	1678 Waycross	Deltona
Vivian Ct	1743 Vivian Ct	Deltona
Gainesville	1510 Gainesville	Deltona
Briarwood	1299 Briarwood	Deltona
Bloomfield	1681 Bloomfield	Deltona
Elkcam	2700 Elkcam	Deltona
Jessamine	2637 Elkcam	Deltona
2008 Canal	2008 Canal	Deltona
Florida Drive	2250 Florida Drive	Deltona
Enterprise Elementary	3rd Street	Deltona
Kendall Ct	2132 Kendall Ct	Deltona
Sable Ct	2411 Sable Ct	Deltona
Winn Dixie	1215 Providence Blvd	Deltona
Ponce DeLeon Plaza	1870 Providence Blvd	Deltona
Deltona Health Care	1851 Elkcam Blvd	Deltona
Condo B	Providence Blvd	Deltona
Condo A	0 Perimeter Drive	Deltona
Deltona Elementary	2022 Adella Blvd	Deltona
Eric Jason Ct	Eric Jason Ct	Deltona
Cardinal	2911 Cardinal Rd	Deltona
IHOP	326 Dirkson Rd	Deltona
River Oaks	355 Dirkson Rd	Deltona
Discovery Elementary	975 Abigail Drive	Deltona
Autumn Woods	183 Autumn Ridge	Deltona
Save-a-lot	Courtland/Howland	Deltona
Publix	2058 Saxon	Deltona
Sterling Park	1700 Sterling Park	Deltona
Twin Lakes	638 Copper Beach	Deltona
Saxon Ridge	442 Haversham Rd	Deltona
Cowentry Estates	397 Elizabeth St	Deltona
CITY HALL LIFT STATION #58	2345 Providence Blvd	Deltona
Spirit Elementary	1500 Meadowlark	Deltona
Sunrise Elementary	3155 Phoenetia	Deltona
Forest Lake Elementary	1600 Doyle Road	Deltona
Osteen Elementary	500 Doyle Road	Deltona
Pine Ridge High School	926 Howland Blvd	Deltona
Live Oaks	925 Blue River	Deltona
Pride Elementary	1100 Learning Lane	Deltona
Lake Baton	1300 Lake Baton Drive	Deltona
Thornby Park	110 Providence Blvd	Deltona
ZUBER LIFT STATION #1	551 COMMONWEALTH BLVD #LS-1	Port Orange
ISABELLE LIFT STATION #2 & RTU	5132 ISABELLE AVE #LS-2	Port Orange
CYPRESS HEAD #1 LIFT STATION #3	6251 S WILLIAMSON BLVD #LS-3	Port Orange
STERLING CHASE LIFT STATION #4	6085 PHEASANT RIDGE DR #LS-4	Port Orange
CHARLES STREET LIFT STATION #5 & RTU	1000 CHARLES ST #LS-5	Port Orange
OCEANS LIFT STATION #6 & RTU	100 OCEAN AVE #LS-6	Port Orange
BARNETT BANK LIFT STATION #7 & RTU	4382 HALIFAX DR #LS-7	Port Orange
CYPRESS HEAD #2 LIFT STATION #8	6410 CYPRESS SPRINGS PKWY #LS 8	Port Orange
HALIFAX EST LIFT STATION #9 & RTU	1206 SPARTON AVE #LS-9	Port Orange
NIXON/BIRO LIFT STATION #10	850 NIXON LN #LS-10	Port Orange
CHRISTIANCY LIFT STATION #11 & RTU & GENERATOR	5403 CHRISTIANCY AVE #LS-11	Port Orange
ATLANTIC HIGH SCHOOL LIFT STATION #12 & RTU	1250 REED CANAL RD #LS-12	Port Orange

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
SUMMERTREES SOUTH LIFT STATION #13 & RTU	6037 WINDING RIDGE LN # LS-13	Port Orange
PARKWOOD LIFT STATION #14 & RTU	1201 VAGABOND DR # WS 1TS NVA # LS14	Port Orange
SABLE CREEK LIFT STATION #15 & RTU	6103 SABAL CREEK BLVD # LS-15	Port Orange
SAWGRASS POINT LIFT STATION #16	5995 SAWGRASS POINT DR # LS-16	Port Orange
VINEYARDS LIFT STATION #17 & RTU	1480 TAYLOR RD # LS-17	Port Orange
CAMBRIDGE EST LIFT STATION #18 & RTU	220 N BRIGHTON DR # LS-18	Port Orange
BEACON WOODS LIFT STATION #19	3634 DONNA ST # LS-19	Port Orange
NORMAN ST LIFT STATION #20 & RTU	5032 RIVERSIDE DR # LS-20	Port Orange
SPRUCE CREEK HIGH LIFT STATION #21	801 TAYLOR RD # LS-21	Port Orange
SOUTHERN PINE LIFT STATION #22 & RTU	28 ELDA LN SWC LAWRENCE CT # LS-22	Port Orange
CAMBRIDGE WILLAS #23 & RTU (CENTER OF ROAD)	435 WILTSHIRE BLVD # NS 200E MYSTIC #LS-23	Port Orange
SUMMERTREES LIFT STATION #24 & RTU	5950 S WILLIAMSON BLVD # LS-24	Port Orange
SANCTUARY LIFT STATION #25 & RTU	6126 SANCTUARY GARDEN BLVD #LS 25	Port Orange
HARBOUR POINT LIFT STATION #26 & RTU	1201 HARBOUR POINT DR # LS-26	Port Orange
DEEP FOREST LIFT STATION #27 & RTU	921 SANDCREST DR # NEC #LS-27	Port Orange
SLEEPY HOLLOW LIFT STATION #28	700 SLEEPY HOLLOW DR # LS-28	Port Orange
MAPLEWOOD LIFT STATION #29 & RTU	4075 CHAMBERLIN BLVD # LS-29	Port Orange
RAVENWOOD LIFT STATION #30 & RTU	2 WOODSIDE DR # LS-30	Port Orange
WEST PORT SQ LIFT STATION #31 & RTU	5798 S WILLIAMSON BLVD # LS-31	Port Orange
FOXBORO #1 LIFT STATION #32 & RTU	5795 DEVON ST # LS-32	Port Orange
LAURELWOOD LIFT STATION #33	717 LARADO DR # LS-33	Port Orange
GOLDEN POND LIFT STATION #34 & RTU	6200 SPRUCE CREEK RD # LS-34	Port Orange
WOODS LIFT STATION #35 & RTU	1167 APPLE CT # N END #LS-35	Port Orange
WILLOW RUN #1 LIFT STATION #36 & RTU	1105 W WILLOW RUN DR # LS-36	Port Orange
SWEETWATER HILLS LIFT STATION #37 & RTU	763 TUMBLEBROOK DR # NWC BRNCH #LS-37	Port Orange
WATER EDGE #2 LIFT STATION #38	1698 CREEKWATER BLVD #LS-38	Port Orange
NOVA & HERBER LIFT STATION #39 & GENERATOR	3655 S NOVA RD # LS-39	Port Orange
SUGAR FOREST LIFT STATION #40 & RTU	800 SUGAR HOUSE BLVD # LS-40	Port Orange
LAMPLIGHTER LIFT STATION #41	3202 S NOVA RD # LS-41	Port Orange
WATER EDGE #1 LIFT STATION #42 & RTU	1750 NILOUFAR LN #LS-42	Port Orange
CENTRAL PARK LIFT STATION #43 & RTU	520 CENTRAL PARK BLVD #SWC #LS-43	Port Orange
BRANDY HILLS LIFT STATION #44	1058 TOMPKINS DR # SS AT END #LS-44	Port Orange
CRANE LAKE #1 LIFT STATION #45	1851 CRANE POINT DR # LS-45	Port Orange
COUNTRYSIDE LIFT STATION #46 & GENERATOR	633 TAYLOR RD # LS-46	Port Orange
HAWKS RIDGE LIFT STATION #47 & RTU	782 OSPREY DR # LS-47	Port Orange
RIVERWOOD LIFT STATION #48 & RTU	6148 DEL MAR DR # LS-48	Port Orange
SOUTHWIND LIFT STATION #49	1481 MADELINE AVE # LS-49	Port Orange
WILLOW RUN #2 LIFT STATION #50	1249 FRANKLIN DR # NWC #LS-50	Port Orange
PICKWICK LIFT STATION #51	20 DOWNING DR # LS-51	Port Orange
FOREST LAKE LIFT STATION #52	1863 CHORPASH LN # LS-52	Port Orange
GLENWOOD VILLAGE LIFT STATION #55	4692 HIDDEN LAKE DR # LS-55	Port Orange
TOWN PARK #56 & RTU	1584 MADELINE AVE # LS-56	Port Orange
LA COSTA LIFT STATION #57	1151 LA COSTA VILLAGE BLVD #LS-57	Port Orange
CITY HALL LIFT STATION #58	1000 CITY CENTER CIR # LS-58	Port Orange
SAMM AVE LIFT STATION #59	980 CANAL VIEW BLVD # LS-59	Port Orange
CLARK'S LIFT STATION #60 & BUILD & GENERATOR	5891 S WILLIAMSON BLVD # LS-60	Port Orange
CAR WASH STATION #61	1784 DUNLAWTON AVE # LS-61	Port Orange
ANGLERS LIFT STATION #62	4863 ORANGE BLVD # LS-62	Port Orange
LANCEWOOD LIFT STATION #63	5658 LANCEWOOD DR # LS-63	Port Orange
TOWNHOMES WEST LIFT STATION #64 & RTU	3532 CREEKSIDE RD # LS-64	Port Orange
FALCON CREST LIFT STATION #65	6043 SPRUCE CREEK RD # LS-65	Port Orange
WEST BAYSHORE #2 LIFT STATION #66	5479 W BAYSHORE DR # LS-66	Port Orange
WEST BAYSHORE #1 LIFT STATION #67	5539 W BAYSHORE DR # LS-67	Port Orange

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
CROSS CREEK LIFT STATION #68	4603 SECRET RIVER TRL # LS-68	Port Orange
OAKLAND PARK LIFT STATION #69	432 BRAHMA LN # LS-69	Port Orange
INTRACOASTAL VILLAS #70	3333 S RIDGEWOOD AVE # LS-70	Port Orange
FOXBORO #2 LIFT STATION #71 & RTU	5561 MILES DR # LS-71	Port Orange
CRANE LAKES #2 LIFT STATION #72	1991 CRANE LAKES BLVD # LS-72	Port Orange
SHALLOW BROOK LIFT STATION #73	4551 ALDER DR # LS-73	Port Orange
SKY LAKE LIFT STATION #74	5932 BOGGS FORD RD # LS-74	Port Orange
GROVES LIFT STATION #75	3800 MADELINE AVE # LS-75	Port Orange
BAYWOOD LIFT STATION #76	401 BAYWOOD CIR # LS-76	Port Orange
WINDSOR HILLS LIFT STATION #77	5798 WINDSOR HILL DR # LS-77	Port Orange
EAST BAYSHORE LIFT STATION #78	75 E BAYSHORE DR # LS-78	Port Orange
RIVERSIDE LIFT STATION #79	5741 RIVERSIDE DR # LS-79	Port Orange
CEDAR LIFT STATION #80	4 CEDAR ST # LS-80	Port Orange
COMMONWEALTH LIFT STATION #81	114 COMMONWEALTH BLVD # LS-81	Port Orange
LOWE'S - GATEWAY LIFT STATION #82	1751 DUNLAWTON AVE # LS-82	Port Orange
MONARCH LIFT STATION #83 & RTU	5401 S WILLIAMSON BLVD # LS-83	Port Orange
PLANTATION I #85	1508 MCGINNIS AVE #LS-85	Port Orange
WHISPERING WOODS LIFT STATION #87	858 AIRPORT RD # LS-87	Port Orange
CORACI #88	1771 TOWN WEST BLVD	Port Orange
COQUINA COVE #89	1998 TOWN WEST BLVD	Port Orange
SUNSET COVE #90	3885 SUNSET COVE DRIVE	Port Orange
WATERS EDGE #3 #91	FORKMEAD LANE	Port Orange
BUTTERMILK #92	1151 BUTTERMILK LN # LS-92	Port Orange
BOURBON STREET #93	3860 BOURBON ST # LS-93	Port Orange
CRYSTAL LAKE #94	REED CANAL ROAD	Port Orange
SEABIRD ISLAND LIFT STATION #101	105 DUNLAWTON AVE NWC SEABIRD # LS-101	Port Orange
CORAL WAY LIFT STATION #102	63 DUNLAWTON AVE # LS-102	Port Orange
JADE WINDS LIFT STATION #103	3590 PENINSULA DR (3600)	Port Orange
OCEAN WAY #6 PONCE INLET #104	86 OCEAN WAY DR # LS-104	Port Orange
INLET POINT #8 PONCE INLET #105	4879 S PENINSULA DR # LS-105	Port Orange
P.I. LIFT STATION MASTER STATION #106 & RTU & GENERATOR	4668 S PENINSULA DR # LS-106	Port Orange
DEEP WATER PONCE INLET #107	133 INLET HARBOR RD # LS-107	Port Orange
LIGHTHOUSE SHORES #6 LIFT STATION PONCE INLET #108 & RTU	4752 S ATLANTIC AVE # LS-108	Port Orange
SEAGULL LANDING #3 LIFT STATION PONCE INLET #111	4431 S PENINSULA DR # LS-111	Port Orange
ANCHOR DR #2 PONCE INLET #112	4354 S PENINSULA DR # LS-112	Port Orange
LAS OLAS #113	37 MAR AZUL N # LS-113	Port Orange
VENETIAN WAY SOUTH #114	230 S VENETIAN WAY # LS-114	Port Orange
SURFSIDE #115	3601 SURFSIDE TER # LS-115	Port Orange
CARDINAL #116	3812 CARDINAL BLVD LS-116	Port Orange
Hillcrest Lift station	0 Wedgewood Ct	Orange City
Sandlewood Lift station	2332 Sandlewood Dr	Orange City
Dresden Ct Lift station	410 Dresden Ct	Orange City
Pineview Lift station	631 Pineview Dr	Orange City
Sunburst RV Lift station	2300 E. Graves Ave	Orange City
Monastery Lift station	0 Monastery Rd	Orange City
Shadowridge Lift station	842 Loral Leaf Dr	Orange City
Irrigation Pond Lift station	2134 Hollowridge Dr	Orange City
Sherwood Oaks Lift station	401 Sherwood Oaks Rd	Orange City
Target Lift station	2575 Enterprise Rd	Orange City
Florida Hospital Lift station	1055 Saxon Blvd	Orange City
OCS Water Plant Lift station	743 Harley Strickland Blvd	Orange City
Steak & Shake Lift station	927 Saxon Blvd	Orange City
Home Depot Lift station	2370 Veterans Memorial Parkway	Orange City
Chick Fil A	1139 Saxon Blvd	Orange City
Oakhurst Lift station	1292 Ivy Lake Dr	Orange City
Deltona Memorial	Saxon Blvd.	Orange City
Well #1	Country Village	Orange City

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
Lift Station #1	Opposite 475 Carswell Avenue	Holly Hill
Lift Station #2	231 Riverside Drive	Holly Hill
Lift Station #3	504 Riverside Drive	Holly Hill
Lift Station #4	345 10th Street	Holly Hill
Lift Station #5	946 Riverside Drive	Holly Hill
Lift Station #6	1136 State Avenue	Holly Hill
Lift Station #7	1300 Riverside Drive	Holly Hill
Lift Station #8	State Avenue opposite 1641	Holly Hill
Lift Station #9	1601 Riverside Drive	Holly Hill
Lift Station #10	410 Dorothy Avenue	Holly Hill
Lift Station #10a	429 3rd Street	Holly Hill
Lift Station #11	440 Magnolia Avenue	Holly Hill
Lift Station #11a	702 Commercial Drive	Holly Hill
Lift Station #12	620 Center Lane	Holly Hill
Lift Station #13	397 Dubbs Drive	Holly Hill
Lift Station #14	660 6th Street	Holly Hill
Lift Station #15	619 S. Flamingo Drive	Holly Hill
Lift Station #16	834 8th Street	Holly Hill
Lift Station #17	566 10th Street	Holly Hill
Lift Station #17a	1017 Chippewa Trail	Holly Hill
Lift Station #17b	Great Oaks Circle	Holly Hill
Lift Station #18	460 Walker Street	Holly Hill
Lift Station #18a	1000 15th Street	Holly Hill
Lift Station #19	407 Flomich Street	Holly Hill
Lift Station #20	926 Flomich Street	Holly Hill
Lift Station #21	1000 Walker Street	Holly Hill
Lift Station #24	944 Alabama Avenue	Holly Hill
Lift Station #25	Riviera Country Club	Holly Hill
Lift Station #26	1600 Nova Road (Walgreen's)	Holly Hill
Lift Station #27	2020 Ridgewood Avenue	Holly Hill
Lift Station #28	1812 Ridgewood Avenue	Holly Hill
Dog Park Lift Station	980 Alabama Avenue	Holly Hill
1. CHUCK WALKER	190 E. WISCONSIN AVE.	DeLand
2. WALT/GARFIELD	401 S. GARFIELD	DeLand
3. CRESCENT PARKWAY	905 CRESCENT PARKWAY	DeLand
4. PLYMOUTH/KANSAS	803 E. PLYMOUTH	DeLand
5. PENN/DELAWARE	629 DELAWARE N.	DeLand
6. JR. HIGH	217 N. DELAWARE	DeLand
7. WINN./THOMPSON	422 W. WINNEMISSETT	DeLand
8. ALABAMA	801 S. ALABAMA	DeLand
9. MONTGOMERY-GATOR PIT	123 S. MONTGOMERY	DeLand
10. MAY STREET	851 W. MAY STREET	DeLand
11. CANDLELIGHT	1039 OAKTREE LANE / Libson Pkwy	DeLand
12. PLYMOUTH/KENTUCKY	605 E. PLYMOUTH	DeLand
13. BLUE LAKE HEIGHTS	1352 CHRIS AVE.	DeLand
14. SAMBO'S	121 W. MANDARIN	DeLand
15. PLYMOUTH PLACE	1015 NEW BEDFORD	DeLand
16. HILL/BERESFORD	891 E. BERESFORD AVE.	DeLand
17. 44/RR	2461 W HY 44 AT RR	DeLand
18. STONE STREET	1100 N. STONE ST.	DeLand
19. BLUE LAKE SCHOOL ELEM.	1396 E. WISCONSIN	DeLand
20. LAKE LINDLEY	998 VILLAGE LAKE DR.	DeLand
21. MILLERS	1002 W. PLYMOUTH AVENUE	DeLand

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
22. NATURES WOOD	1226 NATURES WOODS BLVD. 4623993	DeLand
23. AIRPORT II	395 PISTOL RANGE RD.	DeLand
24. AIRPORT I	1501 LANGLEY AVE.	DeLand
25. BURGONE	1101 BURGOYNE RD.	DeLand
26. VALLEY FORGE	1100 VALLEY FORGE	DeLand
27. LAKE MAMIE	109 E. LAKE MAMIE RD.	DeLand
28. HIDDEN HILLS I	227 PALM COVE DR.	DeLand
29. HIDDEN HILLS II	4190 SPRING LAKE DR.	DeLand
30. TRAILS I	950 SHADY BRANCH TRAIL	DeLand
31. TRAILS II	34 OLD TREE LINE TRAIL	DeLand
32. RAINTREE	368 RAINTREE CIRCLE	DeLand
33. VOORHIS (OAKS)	1630 E. VOORHIS AVE.	DeLand
34. HILL/WALTS	400 S. HILL	DeLand
35. REGIONAL SHOPPING PL.	2659 REGIONAL SHOP. PLAZA	DeLand
36. GLENN EAGLES	101 S. GLENN EAGLES DR.	DeLand
37. HEATHER GLENN	1449 HEATHER GLENN DR.	DeLand
38. QUAIL HOLLOW	1860 HONTOON RD.	DeLand
39. ROSEWOOD	2660 GRACIE DR.	DeLand
40. WHISPERWOOD	3070 TURTLE DOVE TR.	DeLand
41. LEXINGTON/RAINES	1425 INTERNATIONAL SPDWY.	DeLand
42. CHURCH ADAMS	807 E. CHURCH	DeLand
43. CASCADES	1025 CLEAR LAKE/1201S. SR 15A	DeLand
44. ARIZONA (VICTORIA PL)	410 BERWICK CIRCLE	DeLand
45. BENT OAKS	1557 ROCKWELL HGTS. DR.	DeLand
46. ATHENS	122 N. FLORIDA AVE.	DeLand
47. STORM STATION	1101 S. AMELIA AVE	DeLand
48. W. CAROLINA / ADELLE	422 W. CAROLINA AVE	DeLand
49. EAST BROOK	647 ASTORIA DR.	DeLand
50. LAKESHORE TRAILS	7754 ROYAL FERN CIR./0 WINTERBERRY	DeLand
51. SPRING ARBOR	1219 W. PLYMOUTH	DeLand
52. VICTORIA SQUARE	195 DODGE AVE.	DeLand
53. CROSSCREEK	1609 KINNAN TR	DeLand
54. SPRING HILL #1	492 W. MATHIS AVE.	DeLand
55. COUNTY FAIRGROUNDS	370 GOSSAMER RD	DeLand
56. COUNTY TRANSFER STATION	3151 E. NEW YORK AVE	DeLand
57. COMFORT INN	400 E. INTERNATL. SPDWY	DeLand
58. WINDROW BUILDING	1101 S. AMELIA AVE.	DeLand
59. N. STONE MEDICAL	1090 N. ORANGE AVE.	DeLand
60. WESTSIDE MASTER REPUMP	1001 N. HAZEN AVE.	DeLand
61. DIVISION/KENTUCKY	675 E. DIVISION ST.	DeLand
62. SOUTH POINT COMMONS	2470 S. WOODLAND BLVD.	DeLand
63. NORTHGATE	295 E. INTERNATL. SPDWY.	DeLand
64. PLUMOSUS PARK	190 E. TAYLOR RD.	DeLand
65. BALTIMORE/CLARA	1485 S. CLARA AVE.	DeLand
66. SAGO PARK	2395 N. WOODLAND BLVD.	DeLand
67. KEPLER RIDGE	2265 N. KEPLER RD.	DeLand
68. BLUE LAKE WOODS	1375 E. NEW YORK AVE	DeLand
69. AIR-TECH PARK	930 E. BISCAYNE	DeLand
70. BADCOCK HOME FURN.	1631 STATE RD. 15A	DeLand
71. ARVIDA MASTER PUMP	1280 E. TAYLOR RD.	DeLand
72. CAMPGROUND	1898 SKYDIVE DR.	DeLand
73. PARADE CIRCLE	1660 PARADE CIRCLE	DeLand
74. WALGREENS	117 E. ROSEHILL AVE.	DeLand

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
75. FREEDOM ELEMENTRY	1395 S.BLUE LAKE AVE.	DeLand
76. DOT OFFICES	1650 KEPLER AVE.	DeLand
77. CRYSTAL COVE	2337 CRYSTAL OAK DR.	DeLand
78. VICTORIA PARK COMMONS	2711 MARTIN LUTHER KING AV.	DeLand
79. VICTORIA PARK HILLS	1385 ORANGE CAMP RD.	DeLand
80. GEO.MARKS ELEMENTARY	1000 N. GARFIELD AVE.	DeLand
81. DELAND HIGH SCHOOL	800 OLD N. HILL AVE.	DeLand
82. WATERFORD LAKES	409 S. LAKE LINDLEY	DeLand
83. NSB HANGERS	2000 OLD DAYTONA RD	DeLand
84. SW MIDDLE SCHOOL	605 W. NEW HAMPSHIRE AVE	DeLand
85. LAKES OF DeLAND I	3562 AQUAMARINE DR.	DeLand
86. N. FIRE STATION	257 W. INT.SPDWY BLVD.	DeLand
87. WILLOW RIDGE	000 E. MINNESOTA	DeLand
88. VICTORIA GARDENS I	1134 HERON POINT WAY	DeLand
89. VICTORIA HILLS II	1805 BLUE LAKE AVE	DeLand
90. WOODS AT SOUTHBRIDGE	811 E. BEREFORD AVE.	DeLand
91. LAKES OF DeLAND II	832 JADE PRKWY	DeLand
92. CARRIAGE APTS.	213 DYSON DRIVE	DeLand
93. FOREST TRACE	1501 W. MINNESOTA AVE	DeLand
94. GLENNWOOD SPRINGS	1305 WEYMOUTH DR.	DeLand
95. BERRYS RIDGE	3757 AIRPORT RD.	DeLand
96. NORTH RIDGE	125 BLANCO DR.	DeLand
97. PARKMORE MANOR	776 ASTORIA DR.	DeLand
98. HERITAGE PLACE	810 DEERFERN AVE.	DeLand
99. RIDGEWOOD CROSSING	401 S. RIDGEWOOD AVE.	DeLand
100. WP #9 / SE FIREHOUSE	1483 E. TAYLOR RD	DeLand
101. SADDLEBROOK RESERVE	134 SADDLEBROOK WAY	DeLand
102. MALLORY SQUARE	621 N. HAZEN RD	DeLand
103. DeLAND CROSSING	3051 E. NEW YORK AVE	DeLand
104. CLARA PLACE APTS.	318 W. NEW HAMPSHIRE AVE.	DeLand
105. VICTORIA FARMS NW	202 E. CHERRY PLACE	DeLand
106. THE ENCLAVE	133 CASSABELLA BLVD.	DeLand
107. COUNTRY CLUB VILLAS	52 BARRINGTON AVE.	DeLand
108. WELLINGTON WOODS	501 ORANGE CAMP AVE	DeLand
109. WOODLAND CROSSING	1706 N. WOODLAND BLVD.	DeLand
110. THE HIGHLANDS	305 SOUTHERN WINDS BLVD.	DeLand
111. BRANDY/TRAILS MASTER	465 E. LAKE MAMIE AVE	DeLand
112. CLARA / CALVIN	1175 S. CLARA AVE	DeLand
113. NORTH ACCESS RD I	2123 EDSON DR.	DeLand
114. NORTH ACCESS RD II	2245 EDSON DR.	DeLand
115. CITRUS GROVE ELEMENTRY	729 N. HAZEN AVE.	DeLand
116. TAYLOR PLACE APTS	1573-101 S. WOODLAND BLVD.	DeLand
117. ST. JOHN'S MARINA	NONE PROVIDED	DeLand
118. HAMPTON INN	30 SUMMIT PLACE	DeLand
119. COUNTRY CLUB CORNERS	NONE PROVIDED	DeLand
120. COUNTRY CLUB CORNERS II	NONE PROVIDED	DeLand
121. I4/44 BUSINESS CENTER	NONE PROVIDED	DeLand
KEPLER OAKS	NONE PROVIDED	DeLand
TWELVE OAKS I	NONE PROVIDED	DeLand
SPRINGWOOD TOWNHOMES	NONE PROVIDED	DeLand
VICTORIA HILLS III	NONE PROVIDED	DeLand
OAK HAMMOCK RESERVE	NONE PROVIDED	DeLand
TWELVE OAKS II	NONE PROVIDED	DeLand

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Lift and Pump Stations (Continued)

Facility Name	Address	Jurisdiction
BERESFORD WOODS	NONE PROVIDED	DeLand
GARDEN CROSSING	NONE PROVIDED	DeLand
THEATRES MULTIPLEX	NONE PROVIDED	DeLand
RIVERWALK ESTATES	NONE PROVIDED	DeLand
THE WARNERS	NONE PROVIDED	DeLand
PELHAM SQUARE ESTATES	NONE PROVIDED	DeLand
TAYLOR ESTATES	NONE PROVIDED	DeLand
ROYAL OAKS	NONE PROVIDED	DeLand
HUNTINGTON DOWNS	NONE PROVIDED	DeLand
SIX ACRE SUBDIVISION	NONE PROVIDED	DeLand
OAK LANDING	NONE PROVIDED	DeLand
IVANHOE CENTRAL	NONE PROVIDED	DeLand
MILL LAKE STATION	291 BLUE SPRINGS AVENUE	Orange City
INDUSTRIAL DRIVE STATION	259 INDUSTRIAL DRIVE	Orange City
KINGS LAKE STATION	305 KINGS LAKE DRIVE	DeBary
LAKE CHARLES STATION	HIGHLAND AVENUE	DeBary
LAKE SUSAN STATION	96 US HIGHWAY 17-92	DeBary
DGCC ENTRANCE POND STATION	100 DEBARY PLANTATION BLVD	DeBary
QUAIL LAKE STATION	CADDIE DRIVE	DeBary
NO NAME LAKE STATION	HIGHBANKS ROAD	DeBary
Station 1	1690 S. Palmetto Avenue	South Daytona
Station 2	501 Big Tree Road	South Daytona
Station 3	200 Ridge Boulevard	South Daytona
Station 4	2326 Anastasia Drive	South Daytona
Station 5	635 Violet Street	South Daytona
Station 6	808 Valencia Road	South Daytona
Station 7	586 Brook Circle	South Daytona
Station 8	2451 S Ridgewood Avenue	South Daytona
Station 9	29 Sandusky Circle	South Daytona
Station 10	918 Reed Canal Road	South Daytona
Station 11	8 1/2 Spinnaker Circle	South Daytona
Station 12	2025 Hickorywood Drive	South Daytona
Station 13	2938 Lantern Drive	South Daytona
Station 14	794 Aspen Drive	South Daytona
Station 15	2936 Foxcroft Lane	South Daytona
Station 16	407 Banana Cay Drive	South Daytona
Station 17	1610 Magnolia Avenue	South Daytona
Station 18	115 Bryan Cave Road	South Daytona
Station 19	765 Big Tree Road	South Daytona
Station 20	1017 Green Acres Circle	South Daytona
Station 21	2302 S. Nova Road	South Daytona
Station 22	3198 S. Nova Road	South Daytona

APPENDIX E: CRITICAL FACILITY VULNERABILITY ASSESSMENT

Additional Addendum: Daytona Beach Fuel Tanks

The following table lists the fuel tanks located within the City of Daytona Beach, Florida.

Facility ID	SITE NAME	TANK ATTRIBUTES	HOURS OF OPERATION	REQUIRES TRUCK WITH PUMP	CODB PROJECT MANAGER
9700983	Bethune Point WWTP 1 Shady PL Daytona Beach, FL 32114	1 ea. 6,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1 ea. 1,000 gal. Vehicular Diesel Doubled walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
8631491	Fire Station #3 945 N. Halifax Ave. Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) fiberglass UST	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
9812157	Police Dept 129 Valor Blvd. Daytona Beach, FL 32114	1ea, 6000 gal Vehicular diesel Double walled	7am-5pm-5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
8622691	Westside Regional WWTP 3651 LPGA Blvd. Daytona Beach, FL 32117	2 ea. 6,000 gal. Vehicular diesel Double walled (DW) steel AST. 1 ea. 4,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1 ea. 12,000 gal. Vehicular Diesel Double walled (DW) steel UST. 1 ea. 12,000 gal. Unleaded Gas Double Walled (DW) steel UST.	7am-5pm, 5 days	Yes Yes No no	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
8622689	Public Works Complex 950 Bellevue Avenue Daytona Beach, FL 32114	2 ea. 12,000 gal. Unleaded gas Double walled (DW) steel AST. 1 ea. 12,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1 ea. 2,000 gal. Unleaded gas Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
8517330	Golf & Country Club 600 Wilder Blvd. Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST. 1ea. 2,000 gal. Unleaded Gas Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
9300590	Lift Station #1110 1612 Richard Petty Blvd. Daytona Beach, FL 32115	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
8631492	Fire Station #4 1675 Mason Ave. Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
9300589	Lift Station #1162 2020 Beville Road Daytona Beach, FL 32115	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us
9300588	Lift Station #1105 647 Shady Place Daytona Beach, FL 32114	1 ea. 1,000 gal. Vehicular Diesel Double walled (DW) steel AST.	7am-5pm, 5 days	Yes	Name: Tony Segreto Phone: 386-671-8712 Cell : 321-436-7479 Email: segreto@codb.us

APPENDIX F: INDIVIDUAL JURISDICTIONAL MITIGATION PLANS

The Mitigation Plans for all 17 jurisdictions within Volusia County are located in a live, online document in an attempt to streamline the updating process.

In addition to the Mitigation Action Plan (in section 9 of this report) which lists all active projects, there are a number of completed and terminated projects that are not included in this listing. The individual Jurisdictional Mitigation Plans can be found at the link below.

[Link to Mitigation Plans](#)

Text to Link: <ftp://ftp.ecfrpc.org/Live%20Links/Volusia%20LMS/>

Click on "Initiatives List"

Username: pj

Password: pjP4ss3

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: DAYTONA BEACH

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Daytona Beach.

DAYTONA BEACH | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	1,292	1,081	\$316,533,574	\$398,921,520	\$715,455,094	\$512,415,698
Category 2	2,793	2,153	\$393,703,452	\$633,385,772	\$1,027,089,224	\$667,407,380
Category 3	12,291	10,116	\$470,873,330	\$867,850,024	\$1,338,723,354	\$822,399,062
Category 4	14,294	11,945	\$585,339,138	\$1,149,477,833	\$1,734,816,971	\$1,099,713,755
Category 5	14,700	12,306	\$642,429,465	\$1,318,434,326	\$1,960,863,791	\$1,169,549,896

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	15,102	12,495	\$1,185,206,025	\$3,228,526,829	\$4,413,743,039	\$2,637,578,051
High Risk	1,370	1,120	\$110,718,476	\$312,593,326	\$423,311,802	\$292,031,819
Very High Risk	7,422	6,839	\$399,200,179	\$1,493,895,123	\$1,893,095,302	\$1,261,302,031

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: DAYTONA BEACH SHORES

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Daytona Beach Shores.

DAYTONA BEACH SHORES | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	152	111	\$100,585,029	\$122,779,051	\$223,364,080	\$202,762,343
Category 2	286	212	\$127,338,502	\$141,949,299	\$269,287,801	\$238,831,763
Category 3	686	548	\$154,091,975	\$161,119,547	\$315,211,522	\$274,901,183
Category 4	815	665	\$164,040,623	\$187,548,884	\$351,589,507	\$301,336,432
Category 5	815	665	\$164,040,623	\$187,548,884	\$351,589,507	\$301,336,432

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	815	665	\$178,678,445	\$235,084,140	\$413,762,585	\$355,941,024
High Risk	0	0	\$0	\$0	\$0	\$0
Very High Risk	0	0	\$0	\$0	\$0	\$0

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: DEBARY

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within DeBary.

DEBARY | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	324	238	\$5,141,203	\$43,329,214	\$94,746,417	\$68,170,704
Category 2	326	239	\$51,619,008	\$43,678,087	\$95,297,095	\$68,448,119
Category 3	326	239	\$51,820,813	\$44,026,960	\$95,847,773	\$68,725,534
Category 4	327	240	\$51,828,288	\$44,027,727	\$95,856,015	\$68,733,776
Category 5	329	241	\$52,616,950	\$44,100,724	\$96,717,674	\$68,828,395

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	430	327	\$46,048,620	\$75,660,588	\$121,709,208	\$89,521,167
High Risk	3,901	3,190	\$200,697,229	\$657,310,218	\$858,007,447	\$587,777,697
Very High Risk	6,099	5,351	\$235,413,834	\$765,908,420	\$1,001,322,254	\$658,068,792

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: DELAND

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within DeLand.

DELAND | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	5,517	4,865	\$265,193,791	\$1,128,691,587	\$1,393,885,378	\$938,546,649
High Risk	1,697	1,527	\$72,963,630	\$369,198,229	\$442,161,859	\$283,677,133
Very High Risk	6,116	5,045	\$221,760,628	\$931,483,842	\$1,153,244,470	\$654,488,071

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: DELTONA

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Deltona.

DELTONA | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 2	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 3	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 4	2	1	\$92,110	\$8,857	\$100,967	\$0
Category 5	2	1	\$92,110	\$8,857	\$100,967	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	7,213	6,491	\$178,686,241	\$848,121,569	\$1,026,807,810	\$600,669,572
High Risk	4,791	3,695	\$134,003,267	\$627,677,106	\$761,680,373	\$435,971,599
Very High Risk	26,375	23,449	\$560,573,441	\$3,282,568,428	\$3,843,141,869	\$2,184,762,773

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: EDGEWATER

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Edgewater.

EDGEWATER | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	366	314	\$105,441,618	\$81,552,303	\$186,993,921	\$140,339,826
Category 2	2,261	1,948	\$189,483,554	\$288,168,048	\$477,651,602	\$329,925,010
Category 3	9,920	8,802	\$273,525,490	\$494,783,793	\$768,309,283	\$519,510,194
Category 4	11,077	9,790	\$302,313,896	\$637,303,998	\$939,617,894	\$627,143,272
Category 5	11,123	9,827	\$303,800,538	\$641,629,355	\$945,429,893	\$631,304,078

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	399	321	\$46,902,690	\$47,634,611	\$94,537,301	\$57,126,027
High Risk	738	503	\$54,707,294	\$109,075,143	\$163,782,437	\$122,844,495
Very High Risk	9,998	9,005	\$319,876,390	\$1,184,879,478	\$1,504,755,868	\$945,496,850

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: HOLLY HILL

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Holly Hill.

HOLLY HILL | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	194	167	\$25,801,886	\$30,132,552	\$55,934,438	\$38,117,316
Category 2	400	360	\$32,042,960	\$51,435,974	\$83,478,934	\$56,513,590
Category 3	4,633	4,195	\$38,284,034	\$72,739,396	\$111,023,430	\$74,909,864
Category 4	5,107	4,637	\$51,502,972	\$118,801,814	\$170,304,786	\$118,766,409
Category 5	5,110	4,640	\$51,629,887	\$118,911,907	\$170,541,794	\$118,935,829

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	2,902	2,674	\$115,559,356	\$319,070,097	\$434,629,453	\$320,257,849
High Risk	43	22	\$845,964	\$2,658,995	\$3,504,959	\$2,023,085
Very High Risk	2,180	1,959	\$71,351,888	\$243,781,521	\$315,133,409	\$214,790,484

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: LAKE HELEN

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Lake Helen.

LAKE HELEN | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	117	30	\$3,938,983	\$6,230,332	\$10,169,315	\$6,439,172
High Risk	262	168	\$11,415,904	\$23,604,372	\$35,020,276	\$22,035,619
Very High Risk	1,315	953	\$46,037,814	\$110,630,220	\$156,668,034	\$91,645,132

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: NEW SMYRNA BEACH

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within New Smyrna Beach.

NEW SMYRNA BEACH | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	2,710	2,263	\$545,329,637	\$556,239,092	\$1,101,568,729	\$753,109,743
Category 2	9,489	8,122	\$1,235,996,619	\$1,597,404,229	\$2,833,400,848	\$1,943,643,519
Category 3	12,041	10,444	\$1,926,663,601	\$2,638,569,366	\$4,565,232,967	\$3,134,177,295
Category 4	12,334	10,706	\$1,952,940,787	\$2,696,763,374	\$4,649,704,161	\$3,205,528,664
Category 5	12,754	11,088	\$1,972,907,139	\$2,771,396,493	\$4,744,303,632	\$3,277,466,061

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	7,454	6,480	\$1,248,488,406	\$1,429,197,043	\$2,677,685,449	\$1,990,677,914
High Risk	2,577	2,210	\$217,818,892	\$481,626,143	\$699,445,035	\$493,015,255
Very High Risk	5,932	5,047	\$340,016,266	\$851,018,653	\$1,191,034,919	\$788,641,286

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: OAK HILL

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Oak Hill.

OAK HILL | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	626	453	\$72,484,465	\$50,648,581	\$123,133,046	\$75,389,343
Category 2	1,091	679	\$86,237,499	\$75,507,531	\$161,745,030	\$99,420,806
Category 3	1,656	1,020	\$99,990,533	\$100,366,481	\$200,357,014	\$123,452,269
Category 4	1,730	1,074	\$101,845,156	\$105,554,586	\$207,399,742	\$127,516,331
Category 5	1,754	1,093	\$102,383,401	\$107,387,060	\$209,770,461	\$128,909,110

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	59	11	\$24,748,035	\$819,002	\$25,567,037	\$974,421
High Risk	892	471	\$38,676,089	\$57,363,588	\$96,039,677	\$64,399,607
Very High Risk	803	611	\$42,728,398	\$59,076,417	\$101,804,815	\$69,940,413

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: ORANGE CITY

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Orange City.

ORANGE CITY | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	348	216	\$50,022,495	\$74,786,904	\$124,809,399	\$113,923,315
High Risk	811	581	\$80,272,598	\$276,503,517	\$356,776,115	\$239,936,274
Very High Risk	2,764	2,386	\$130,709,104	\$433,443,614	\$564,152,718	\$374,484,357

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: ORMOND BEACH

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Ormond Beach.

ORMOND BEACH | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	927	769	\$260,256,044	\$309,139,518	\$569,395,562	\$435,805,288
Category 2	1,457	1,263	\$350,772,981	\$451,795,086	\$802,568,067	\$612,352,861
Category 3	8,662	7,886	\$441,289,918	\$594,450,654	\$1,035,740,572	\$788,900,434
Category 4	11,403	10,462	\$612,627,516	\$1,023,964,919	\$1,636,592,435	\$1,223,671,593
Category 5	12,661	11,603	\$673,213,154	\$1,278,476,752	\$1,951,689,906	\$1,444,841,698

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	2,780	2,541	\$327,179,094	\$540,032,990	\$867,212,084	\$668,582,412
High Risk	5,353	4,796	\$365,173,095	\$1,248,661,275	\$1,613,834,370	\$1,220,722,443
Very High Risk	10,417	9,602	\$697,576,286	\$1,685,417,457	\$2,382,993,743	\$1,673,948,067

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: PIERSON

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Pierson.

PIERSON | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	0	0	\$0	\$0	\$0	\$0
Category 2	0	0	\$0	\$0	\$0	\$0
Category 3	0	0	\$0	\$0	\$0	\$0
Category 4	0	0	\$0	\$0	\$0	\$0
Category 5	0	0	\$0	\$0	\$0	\$0

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	107	29	\$4,260,359	\$2,761,476	\$7,021,835	\$3,266,461
High Risk	735	358	\$16,268,871	\$30,542,047	\$46,810,918	\$28,694,699
Very High Risk	405	274	\$11,335,448	\$46,591,894	\$57,927,342	\$20,692,531

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: PONCE INLET

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Ponce Inlet.

PONCE INLET | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	466	306	\$160,936,727	\$96,496,798	\$257,433,525	\$183,535,659
Category 2	789	561	\$200,816,821	\$163,545,872	\$364,362,693	\$261,304,973
Category 3	1,420	1,055	\$240,696,915	\$230,594,946	\$471,291,861	\$339,074,287
Category 4	1,633	1,243	\$268,237,671	\$268,569,593	\$536,807,264	\$393,346,667
Category 5	1,633	1,243	\$268,237,671	\$268,569,593	\$536,807,264	\$393,346,667

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	1,191	925	\$207,263,957	\$217,818,746	\$425,082,703	\$328,025,753
High Risk	436	318	\$103,172,264	\$103,679,286	\$206,851,550	\$140,041,860
Very High Risk	0	0	\$0	\$0	\$0	\$0

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: PORT ORANGE

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Port Orange.

PORT ORANGE | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	1,532	1,342	\$154,823,802	\$202,641,051	\$357,464,853	\$239,154,031
Category 2	6,593	5,998	\$351,457,391	\$820,346,663	\$1,171,804,054	\$806,345,719
Category 3	10,605	9,718	\$548,090,980	\$1,438,052,275	\$1,986,143,255	\$1,373,537,407
Category 4	13,132	12,024	\$638,924,300	\$1,916,163,624	\$2,555,087,924	\$1,747,704,637
Category 5	14,121	12,972	\$700,252,798	\$2,104,258,871	\$2,804,511,669	\$1,918,028,545

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	7,601	6,963	\$387,667,469	\$963,513,836	\$1,351,181,305	\$973,957,479
High Risk	6,598	6,217	\$329,097,146	\$1,362,329,529	\$1,691,426,675	\$1,258,722,903
Very High Risk	9,341	8,680	\$405,972,741	\$1,690,540,979	\$2,096,513,720	\$1,403,419,446

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: SOUTH DAYTONA

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within South Daytona.

SOUTH DAYTONA | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	458	409	\$67,559,639	\$78,401,012	\$145,960,651	\$119,585,799
Category 2	4,177	3,968	\$202,485,134	\$551,760,404	\$754,245,538	\$520,099,635
Category 3	4,972	4,700	\$337,410,629	\$1,025,119,796	\$1,362,530,425	\$920,613,471
Category 4	5,064	4,768	\$339,018,243	\$1,028,241,724	\$1,367,259,967	\$923,538,650
Category 5	5,064	4,768	\$339,018,243	\$1,028,241,724	\$1,367,259,967	\$923,538,650

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	4,590	4,355	\$208,784,183	\$572,487,504	\$781,271,687	\$543,009,746
High Risk	262	251	\$9,169,580	\$35,328,417	\$44,497,997	\$30,763,720
Very High Risk	212	162	\$10,065,026	\$22,321,003	\$32,386,029	\$29,319,130

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX G: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) RISK AND VULNERABILITY

JURISDICTION APPENDIX: UNINCORPORATED VOLUSIA

This Appendix further identifies the risk and vulnerability from the natural and man-made hazards in Volusia County. The following tables summarize financial exposure to hazard zones for storm surge and fire within Unincorporated Volusia County.

UNINCORPORATED VOLUSIA CO. | Financial Vulnerability to Storm Surge and Fire Risk Zones

Financial Exposure to Storm Surge Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Category 1	17,288	3,463	\$849,799,986	\$2,368,173,965	\$1,500,031,353	\$899,472,256
Category 2	27,620	6,331	\$1,169,262,612	\$3,656,214,914	\$2,231,409,375	\$1,404,188,164
Category 3	40,504	11,933	\$1,488,725,238	\$4,944,255,863	\$2,962,787,397	\$1,908,904,072
Category 4	44,174	14,080	\$1,674,058,601	\$5,369,351,565	\$3,478,355,687	\$2,276,301,841
Category 5	46,757	15,654	\$1,858,631,838	\$5,740,359,384	\$4,013,312,681	\$2,655,929,722

Financial Exposure to Fire Hazard Zones – Cumulative Financial Values within Zones

Hazard Zone	Parcels in Zone	# Bldg./Condo	Land Value	Building Value	Assessed Value	Taxable Value
Low Risk	49,454	7,211	\$1,498,701,938	\$4,201,137,676	\$2,724,917,026	\$1,487,413,978
High Risk	27,196	15,656	\$1,405,203,622	\$3,054,912,917	\$4,240,015,526	\$2,622,809,944
Very High Risk	34,892	25,063	\$1,352,161,953	\$3,748,697,150	\$4,608,124,514	\$3,069,592,950

Data Source(s): FEMA (Flood Data); FDEM (Storm Surge Data); HAZUS (Fire Data); Volusia County (2019 Parcels)

Flooding data included in the Volusia County Floodplain Management Plan (Appendix I)

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

This Appendix identifies the capabilities and potential consequences on a county scale to natural and man-made hazards in Volusia County.

Core Capabilities by Hazard

The table below summarizes the core capabilities that are deemed 'essential' for Volusia County to maintain community control in the event that one or more of the hazards below will occur.

Core Capabilities	Wind	Storm Surge	Flood	Lightning	Tornado	Fire	Drought	Ext. Temp	Sea Lv. Rise	Pandemic	HazMat	Terrorism	
Access Control / ID Verif.										X		X	2
Community Resilience	X	X	X	X	X	X	X	X	X	X	X	X	12
Critical Transportation		X	X								X	X	4
Cybersecurity				X								X	2
Economic Recovery	X	X	X	X	X	X	X	X	X	X	X	X	12
Env.Response/Health/Safety	X	X	X	X	X	X	X	X	X	X	X	X	12
Fatality Management					X					X	X	X	4
Forensics/Attribution											X	X	2
Health/Social Services	X	X	X	X	X	X	X	X	X	X	X	X	12
Housing	X	X	X		X	X			X			X	7
Infrastructure Systems	X	X	X	X	X	X					X	X	8
Intelligence/Info Sharing										X	X	X	3
Interdiction/Disruption										X	X	X	3
L.T. Vulnerab. Reduction	X	X	X	X	X	X	X	X	X	X	X	X	12
Mass Care Services	X		X	X	X	X	X	X		X	X	X	10
Mass Search/Rescue	X	X	X		X	X				X	X	X	8
Nat./Cultural Resources	X	X	X	X	X	X					X	X	8
On-Scene Security/Prot.	X	X	X		X	X				X	X	X	8
Operational Communic.	X	X	X	X	X	X	X	X	X	X	X	X	12
Operational Coordinat'n.	X	X	X	X	X	X	X	X	X	X	X	X	12
Phys. Protective Measure										X		X	2
Planning	X	X	X	X	X	X	X	X	X	X	X	X	12
Public/Pvt. Services/Res.	X	X	X		X	X	X			X	X	X	9
Health/Medical Service	X	X	X	X	X	X	X	X	X	X	X	X	12
Public Info/Warning	X	X	X	X	X	X	X	X	X	X	X	X	12
Risk Resilience Mgmt.	X	X	X	X	X	X	X	X	X	X	X	X	12
Risk Mgmt-Programs	X	X	X	X	X	X	X	X	X	X	X	X	12
Screen/Search/Detection										X	X	X	3
Situational Assessment	X	X	X	X	X	X	X	X	X	X	X	X	12
Supple Chain Integrity										X		X	2
Threats/Hazard Identific.	X	X	X	X	X	X	X	X	X	X	X	X	12
	21	21	22	18	22	21	16	15	15	25	26	31	

Top Core Capabilities by Number of Applicable Hazards

Community Resilience (12)

Economic Recovery(12)

Environmental Response (12)

Health/Social Services (12)

Long Term Vulnerability Reduction (12)

Operational Communication (12)

Operational Coordination (12)

Planning (12)

Health/Medical Services (12)

Public Warning (12)

Risk Resilience Management (12)

Risk Management Programs (12)

Situational Assessment (12)

Threat/Hazard Identification (12)

Top Hazards by Core Capabilities Affected

1. Terrorism (31)

2. HazMat (26)

3. Pandemic (25)

4. Tornado (22)

5. Flood (22)

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES**Resource Requirements and Target Capabilities by Hazard**

This section of the report details the core capability targets and resource requirements for all natural, societal and technological hazards covered in the Local Mitigation Strategy. The tables provided for each hazard are based off of the template created as part of the Threat and Hazard Identification and Risk Assessment Guide (Second Edition) created by the U.S. Department of Homeland Security.

The following hazards are covered within this portion of the THIRA analysis:

- *Flood*
- *Fire*
- *Wind*
- *Storm Surge*
- *Tornado*
- *HazMat Incident*
- *Pandemic*

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Flood

Flooding	
Context Description	A large tropical low has formed off of the coast of Florida and has been held stationary by the presence of a low pressure system moving southward from northern Florida for over three days. An estimated 50% of the parcels within Flood Zone 'A' are affected, 50% of the parcels within Flood Zones 'AH', 'AO' and 'AE' are affected, 75% of the parcels within Flood Zone 'VE' are affected, and 1% of the parcels within Flood Zone X (500-Year Floodplain) are affected. The storm affects the building and assessed values of the parcels hit by an estimated 10%.
Core Capability	
Capability Target	Community Resilience, Critical Transportation, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Fire

Fire	
Context Description	A wildfire spawns and spreads within a 'Very High Risk' area within Volusia County. The fire spreads, and as a result, 1% of the parcels within the 'Very High Risk' zone are affected, 0.5% of the parcels within the 'High Risk' zone are affected, 0.25% of the parcels within the 'Low Risk' zone are affected, and 0.1% of the parcels within the 'No Risk' or 'None' zone are affected. The fire affects parcels uniformly across hazard zones.
Core Capability	
Capability Target	Community Resilience, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/ Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification; Prescribed Burns
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Drought

Pandemic	
Context Description	It is the beginning of summer. East central Florida is in a severe drought, as it has not rained in two months in Volusia County. The drought has caused brushfires to start in the western portions of the County. Dehydration-related deaths in the County have reached 10 since January.
Core Capability	
Capability Target	Community Resilience; Prescribed Burns, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Aerial Reconnaissance and GIS Mapping of Fire, Aerial Firefighting Services (Regional, State, Federal), Inter-County Cooperation and Resource Sharing, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Threat/Hazard Identification, Health/Medical Services, Rapid Medical Air Transport
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Wind

Wind	
Context Description	A Category 3 Hurricane hits Volusia County from the Atlantic Ocean, affecting a large portion of the county with wind damage. An estimated 60% of the parcels within the 111-115 Wind Zone are affected, while 25% of the parcels within the 106-110 Wind Zone and 10% of the parcels within the 105-110 Wind Zone are affected.
Core Capability	
Capability Target	Community Resilience, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Storm Surge

Storm Surge	
Context Description	A Category 3 Hurricane hits Volusia County, affecting a large portion of the county with storm surge damage. An estimated 60% of the parcels within the Category 1 Storm Surge zone are affected, 45% of the parcels within the Category 2 zone are affected, 30% of the parcels within the Category 3 zone are affected, 2% of the parcels within the Category 4 zone are affected and 1% of the parcels within the Category 5 zone are affected.
Core Capability	
Capability Target	Community Resilience, Critical Transportation, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Sea Level Rise

Pandemic	
Context Description	It is the year 2070. A neighborhood located on the barrier islands is beginning to flood frequently due to sea level rise, subsidence and other factors. Property owners are having a hard time selling their properties and the value of the properties is decreasing.
Core Capability	
Capability Target	Pre-Planning as part of the HMGP Program (Demolition, etc.); Sea Level Rise Vulnerability Assessments and Identified Countermeasures; Gray/Green Infrastructure (Sea Walls); Other Protective Measures; Community Resilience; Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Tornado

Tornado	
Context Description	A Category 3 Hurricane spawns several F1 tornadoes near the Ponce Inlet area. 100% of the parcels that are directly hit by the tornado are affected with 100% damage (as a percentage of building value), 50% of the parcels within 1/8 of a mile are affected with 75% damage, 20% of the parcels closer than 1/4 mile but farther than 1/8 mile away are affected with 20% damage, 5% of the parcels closer than 1/2 mile but farther than 1/4 mile away are affected with 2% in damage, and 1% of the parcels farther than 1/2 mile away but less than one mile away are affected with minor, variable damage.
Core Capability	
Capability Target	Community Resilience, Economic Recovery, Environmental Response, Health and Social Services, Housing, Infrastructure Systems, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security/Protection, Operational Communication/ Coordination, Planning, Public/Private Services, Health/Medical Service, Public Info/Warning, Risk Resilience Management, Risk Management Programs, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

HazMat Incident

HazMat Incident	
Context Description	A train traveling along the Florida East Coast Railway crashes into Dubious Chemz, a chemical facility located along the Florida East Coast Railway line in unincorporated Volusia County. The train is not carrying hazardous materials, but the impact with the chemical facility triggers a simultaneous release of 26,000 pounds of chlorine stored in the facility into the air. Wind is registered at 5 miles per hour from the east southeast, humidity is 50% and the air temperature is 85 degrees Fahrenheit. The constant chemical leak lasts for exactly one hour, at which point all 26,000 pounds of chlorine have been released.
Core Capability	
Capability Target	Community Resilience, Critical Transportation, Economic Recovery, Response for Environmental/Health/Safety, Fatality Management, Forensics/Attribution, Health/Social Services, Infrastructure Systems, Intelligence/Information Sharing, Interdiction/Disruption, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/Rescue, Natural and Cultural Resources, On-Scene Security and Protection, Operational Communication, Operational Coordination, Planning, Public/Private Services and Response, Health/Medical Services, Public Info/ Warning, Risk Resilience Management, Risk Management Programs, Screen/ Search/ Detect, Situational Assessment, Threat/Hazard Identification
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Pandemic

Pandemic	
Context Description	An airplane landing at Daytona Municipal Airport carrying 234 passengers becomes overwhelmed by a NLV-like pandemic that sickens 80% of the passenger. After the passengers de-board the plane without a health check, the virus is airborne, has a 20% spread rate (20% of people who come in contact with the infected become infected) and is caught when a person with the sickness comes within 1 foot of a person with the pandemic. Moreover, of the 234 passengers affected with the sickness, those 234 passengers come in contact (or spread the disease) with an average of 7.5 persons per hour. The disease does not inflict casualties until at least 12 to 18 hours after the initial infection period, adding to the number of individuals who can be exposed to the disease from those infected individuals that are still alive.
Core Capability	
Capability Target	Access Control/ID Verification, Community Resilience, Economic Recovery, Response for Environmental/Health/Safety, Fatality Management, Health/Social Services, Intelligence/Information Sharing, Interdiction/ Disruption, Long Term Vulnerability Reduction, Mass Care Services, Mass Search/ Rescue, On-Scene Security and Protection, Operational Communication, Operational Coordination, Physical Protective Measures, Planning, Public/ Private Services and Response, Health/Medical Services, Public Info/ Warning, Risk Resilience Management, Risk Management Programs, Screen/ Search/ Detect, Situational Assessment, Supply Chain Integrity, Threat/Hazard Identification
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Terrorism

Pandemic	
Context Description	A terrorist of unknown domestic or international origin detonates an explosive at the Daytona 500 car race while attendees are exiting the stadium. There are immediate casualties, both fatal and non-fatal, including fatal injuries to the perpetrator. It is unknown whether or not the perpetrator acted alone.
Core Capability	
Capability Target	Federal Coordination of Assets and Intelligence (FBI, CIA); State Coordination of Assets and Intelligence (FDLE); Regional Coordination of Assets and Equipment (CFIX); COOP Planning; Economic Recovery Planning; Mass Care Services; Mass Search/Rescue; On-Scene Law Enforcement Response; Health/Medical Services; Physical Protective Measures; Public Information; Coordination through the Media, Social Media and Law Enforcement; Operational Communication, Operational Coordination
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Extreme Temperatures

Pandemic	
Context Description	It is mid-August and temperatures reach 110 degrees Fahrenheit for five straight days. Students returning to school are beginning to be hospitalized for heat stroke and other heat-related illnesses, and multiple elderly residents have passed away as a result of heat stroke.
Core Capability	
Capability Target	Health/Medical Services; Rapid Medical Air Transport; Mass Care Services; Public Info/Warning Systems; Social Media and Media Outreach; School District Coordination with Schools; Medical Training for School Staff Member(s); Intensive Care Unit; Response for Environmental/Health/Safety; Fatality Management; Coordination with the Federal/State Government; Coordination with the Red Cross
Resource Requirement	
Resources	Number Required

APPENDIX H: HAZARD IDENTIFICATION RISK ANALYSIS (HIRA) CONSEQUENCES

Lightning

Pandemic	
Context Description	A youth sports team is caught in a severe thunderstorm and multiple members of the team are struck by lightning. The sports complex is located in a rural area of west Volusia, not close to any hospital facilities. Some patients need immediate hospital care while others have very minor injuries.
Core Capability	
Capability Target	Health/Medical Services; Rapid Medical Air Transport; Mass Care Services; Mass Search/Rescue; Public Info/Warning Systems; Social Media; National Weather Service Coordination; Regional EMS Support; Inter-Local Agreements for Medical Response; Intensive Care Unit; Medical Specialists
Resource Requirement	
Resources	Number Required

APPENDIX I: VOLUSIA COUNTY FLOODPLAIN MANAGEMENT PLAN

The entire Volusia County Integrated Floodplain Management is imbedded as an appendix within the LMS. The FMP can be found on the following pages of this report.

Beginning in 2020, the Volusia County Integrated Floodplain Management Plan will be updated in conjunction with the Volusia County Local Mitigation Strategy. This is reflected in the title of the Floodplain Management Plan, which has been amended to “2020” from “2018” as part of this report.

Volusia County Integrated Floodplain Management Plan

2020



Prepared for
Volusia County Division of Emergency Management
by
The East Central Florida Regional Planning Council



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I. ACKNOWLEDGEMENTS

The East Central Florida Regional Planning Council would like to thank the Floodplain Management Plan Committee for their participation in the preparation of this plan. The following jurisdictions were instrumental in the completion of this plan: Volusia County, Daytona Beach, Daytona Beach Shores, Debary, DeLand, Deltona, Edgewater, Holly Hill, Lake Helen, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange, and South Daytona. Thank you to the Volusia County Division of Emergency Management for assisting in the plan development and coordination necessary for its success.

II. INTRODUCTION

The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains. The Community Rating System (CRS) grades the various Community Floodplain Management Programs and reduces flood insurance premiums in those communities that meet certain requirements. In order to reduce the potential for personal/property losses in flood prone areas and ensure the lowest possible flood insurance premiums for our residents, Volusia County and the jurisdictions of Daytona Beach, Daytona Beach Shores, Debary, Deland, Deltona, Edgewater, Holly Hill, New Smyrna Beach, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona have developed this Floodplain Management Plan which includes specific jurisdictional plans. The Plan was developed and is updated annually with input from the Volusia County Local Mitigation Strategy Steering Committee, Volusia Prepares; and the Volusia County Growth & Resource Management and Public Works Departments. On June 12, 2013, the Volusia Prepares Steering Committee voted unanimously to incorporate the Plan into the Local Mitigation Strategy.

Activity section 510 of the CRS Coordinator's Manual requires an annual update of the Plan's implementation be made available to the local governing body (distributed electronically), the community, and the media. Copies of this plan are available for review at the Volusia County Kelly Administration Building, 123 West Indiana Avenue, DeLand, and the Daytona Beach Regional Library, 105 East Magnolia Avenue, Daytona Beach. Additionally, copies may be obtained by calling the Volusia County Emergency Management Division, 386-258-4088 or downloading a copy from <https://www.volusia.org/services/public-protection/emergency-management/types-of-disasters/floods>. A copy of this report has also been sent to the Daytona Beach News-Journal, the Orlando Sentinel, and the State of Florida NFIP Coordinating Official. This memorandum documents the current status of the Plan's implementation.

III. BACKGROUND

This Floodplain Management Plan was developed by the East Central Florida Regional Planning Council for Volusia County and the jurisdictions within. The plan is designed to encompass a snapshot of floodplain hazards throughout the county and also provide separate jurisdictional plans developed as the appendices of the main plan. This design promotes a unified approach to mitigation and planning efforts and consistency across the county. As part of the planning process, this plan was integrated with the Volusia County Local Mitigation Strategy document (LMS). The LMS provides in-depth analysis of hazards and mitigation strategies. Various sections of the LMS have been identified throughout this Floodplain Management Plan in order to provide additional information for projects and analysis. The Volusia County Floodplain Management Plan follows the format and outline of the Community Rating System guidance. Individual jurisdictional analysis is provided in Appendix A of this document.

IV. PLANNING PROCESS

A. Organize to Prepare the Plan

The 2020 Volusia County Floodplain Management Plan update was prepared by the East Central Florida Regional Planning Council (ECFRPC), a community planning office, in conjunction with the Volusia County Emergency Management Division, the Volusia County Growth Management Department and the jurisdictions within Volusia County. The ECFRPC project manager is a certified planner by the American Institute of Certified Planners. The planning committee consisted of the Volusia Prepares LMS Working Group, County CRS Coordinator, Floodplain Managers, and additional jurisdictional staff responsible for the implementation of floodplain management strategies, State Mitigation Officers and the Florida Division of Emergency Management. The planning process and committee were supported by the jurisdictional commissions, and the names of the planning team members (Volusia Prepares) are included below. These individuals acted as liaisons between the planning team (VCEM and ECFRPC) and city commissioners for support and adoption of the plan. Members were included in the beginning of the planning process via the Volusia Prepares meetings and were provided copies of the draft plan for comment before final plan adoption.

- **Daytona Beach:** *Kimberly Dixon, Utilities*
- **Daytona Bch. Shores:** *Stewart Cruz, Planning*
- **DeBary:** *Alan Williamson, Public Works*
- **DeLand:** *Maria Becker, Risk Management*
- **Deltona:** *Scott McGrath, Planning*
- **Edgewater:** *Tyna Lynn Hilton, Planning*
- **Holly Hill:** *Steve Juengst, Public Works*
- **Lake Helen:** *Becky Witte, City Clerk*
- **New Smyrna Bch:** *Kyle Fegley, Engineering*
- **Oak Hill:** *Mandy Osweiler, City Clerk*
- **Orange City:** *Raul Palenzuela, Public Works*
- **Ormond Beach:** *Becky Weedo, Planning*
- **Ponce Inlet:** *Hank Baker, Building*
- **Port Orange:** *Amanda Lasecki & Jordan Guido, Engineering*
- **South Daytona:** *John Dillard, Community Dev't*
- **Volusia County:** *Larry LaHue & Aubrie Austin, Emergency Management; Nancy Church, IT*
- **Volusia Schools:** *Russ Tysinger, Maintenance/Ops.*

Several planning committee meetings were held throughout the process. Due to the limited time frame to prepare the planning document, meetings focused on multiple steps of the process. The table below lists the planning team meeting dates, locations and focus areas of each meeting. In addition to these meetings, Volusia Prepares members also met on March 14th, 2018.

Table 1: Planning Committee Meetings

Meeting Name & Attendees	Date	Location	Focus Areas
Kick Off Meeting (ECFRPC, County EM)	3/28/2018	Phone Meeting	Project Budget, Plan and CRS Overview, Planning Process, Planning Team, Public Outreach, Surveys
Interim Planning Meeting #1 (ECFRPC, County EM)	6/8/2018	Volusia County EOC	Public Meetings, Volusia Prepares Meeting, Public Survey, Damage Assessment, Scheduling
Interim Planning Meeting #2 (ECFRPC, County EM, Cities & Towns)	6/20/2018	Volusia County Beach Safety Headquarters	Volusia Prepares Members, Action Plan, Jurisdictional Plans, Vulnerability Analysis, Goals and Objectives
Final Planning Meeting (ECFRPC, County EM)	7/31/2018	Volusia County EOC	Draft Plan, Appendices, Volusia Prepares Steering Committee Adoption (FMP to LMS), Final Updates

B. Involve the Public

As part of the planning process, numerous efforts to engage the public were implemented. The planning committee reviewed the survey and provided comments prior to public release. A public survey was created using surveymonkey.com and the link was provided to all jurisdictions for release in newsletters, utility/water bills, and through websites and social media. The link was also made available on the Volusia County Floodplain website. The survey was also made accessible at the public meetings.

The survey announcements provided contact information in order to request a hard copy of the survey, which was then provided with a return envelope. Postcards were also addressed to other facilities specifically requested by jurisdictions, which provided information

and the survey link. The public survey received a total of 43 responses during its collection period from January 5, 2018 to July 10th, 2018. Statistical results for each individual question are located in Appendix B.

Key findings from the public survey are as follows:

- Over 44.2% of respondents have lived in their current residence for over 10 years.
- Approximately 51.2% of respondents indicated their home was built prior to 1987.
- 46.5% responded that they are not concerned about the possibility of their home flooding, 41.9% are somewhat concerned, and 11.6% are very concerned about the possibility of their home being flooded.
- 27.9% of respondents noted that their home is located within a floodplain, 53.5% are located outside a floodplain, and 18.6% are unsure if their home is located within a designated floodplain.
- Of the 24.5% of respondents knowing within the floodplain, 9.1% are in Zone AE, 18.1% are in Zone A1-A30, 9.1% are in Zone AH. However 63.6% are unsure of their zone classification.
- Nearly 76.2% of respondents indicated that their home, to their knowledge, has never flooded due to natural causes.
 - Of the 4.8% of respondents indicating their home had flooded due to natural causes, 16.7% noted that the last flooding occurred between 2000 and 2009 (this would include the 2004 Hurricanes and TS Fay). 33% flooded in 2017.
 - 50.0% of those respondents who have experienced flooding in their homes noted that the flooding was less than 1 foot in depth, 50.0% experienced between 1 and 2 feet of water.
 - The cost of structural damages associated with this flooding was varied; 50.0% noted less than \$1000; 0% noted between \$5000 and \$50,000; and 50.0% were unsure.
 - The approximate dollar value of personal items lost was varied as well; 50.0% noted less than \$1000 in loss; 0% indicated between \$1,000 and \$1,999; and 0% lost more than \$5,000 of personal items (50.0% were unsure).
- 33.3% of total respondents have flood insurance; 57.1% do not; 9.5% are unsure
- Of the 57.1% without flood insurance, the majority (44.0%) stated that the main reason for not having flood insurance was that they feel there is no real threat of a flood on their property; 16.0% indicated that cost is the main reason.
- Nearly 10.3% of respondents noted that flood mitigation efforts had been implemented on their property. 25.6% were unsure, while 64.1% did not have any mitigation efforts undertaken on their property.

- Mitigation included a variety of efforts from pouring a cement barrier at wall bases, building a flood wall, elevating house slab, control ditches, building swales, fill dirt, elevated property and home, sold property adjacent to home for retention pond, and natural vegetation to act as flood barrier.
- 85.7% of respondents indicated that they have never considered implementing flood management strategies on their property. The reasons for the lack of implementation include time and money.
- No respondents (0%) indicated that their property is currently classified as a repetitive flood loss property. 16.2% are unsure.
- 56.8% of respondents have visited the Volusia County Floodplain website (*up from 25.7% in 2013*)
- 13.5% of respondents are very satisfied with jurisdictional efforts of public involvement and outreach as it concerns flood hazards; 18.9% are somewhat satisfied; 5.4% are somewhat dissatisfied; 2.7% are very dissatisfied, and 59.4% are unaware of public involvement/outreach efforts.

The report appendices provide documentation of the various efforts used to inform the public of the survey (see Press Release, Appendix E) and a copy of the public survey with statistical results for each question (Appendix B).

The business community was engaged in the process through a survey created specifically for business owners. The link to this survey was made available to jurisdictions to release to the various Chambers of Commerce and other business oriented agencies and groups within their community. The link was distributed through various websites at the beginning of the planning process, and through a final press release near the end of the planning process (see Press Release, Appendix E). This survey was also made available at the public meetings for any business owners in attendance. This survey received 3 responses during its collection period from January 5th, 2018 to July 10th, 2018. Appendix C provides a copy of the business survey results.

Main findings from the business survey are as follows:

- 66.7% of respondents have been in business at their current locations for 11- 20 years.
- 100% of buildings were constructed between before 1987
- None of the respondents are “not concerned” about their business flooding and 100% (all 3) are “very concerned” about the flooding possibility of streets accessing their business.

- While 50% of respondents indicated they are located within a designated flood hazard zone, 50% are unsure. Of these respondents, 100% noted that they are unsure of their flood zone. One business skipped this question.
- Being located in a flood zone was a concern in business location for 50% of respondents. One business skipped this question.
- 50% of respondents indicated that their place of business has flooded due to natural/environmental causes; this event occurred in 2017. One business skipped this question.
- Flooding has caused 50% of respondents to close their business for 0-1 days and 50% to close for more than 7 days.
- 50% of respondents have flood insurance for their property while 50% are unsure.
- When asked why they do not have flood insurance, 0% of respondents without flood insurance indicated that they feel there is no real threat of flooding on their property while 100% said it is not cost effective.
- 50% of respondents noted that flood mitigation efforts have been implemented on their property.
- 0% of business respondents are satisfied with public involvement and outreach efforts by local jurisdictions as related to floodplain management.

In Volusia County, a number of Home Owner Associations are associated with developments within the 100 year floodplain. An analysis of the floodplain and home owner association data identified 94 associations within the floodplain. Another specialized survey was developed and due to the availability of only mailing addresses, postcards were sent to the 94 home owners association with information and the link to the survey. This survey was open for comment from January 5th to July 10th, 2018. During this time, 4 surveys were completed, resulting in a 5% response rate. Results of this survey are located in Appendix D.

A total of two public meetings were held during the planning process. The meetings kicked off the public process by obtaining initial comments and input from the public. All public meetings were advertised in the Florida Administrative Weekly and a press release was issued to all jurisdictions and the Volusia County Public Information Officer. Appendix E provides samples of the public meeting announcements conducted throughout the county and within jurisdictions.

Due to the size of Volusia County, it was determined the best way to reach the residents was to hold one meeting on the east side of the county (City Island Library, Daytona Beach) and one on the west side (DeLand Public Library). The meetings were held on June 15th and June 18th, 2018, respectively. The meetings consisted of a presentation on the plan background and purpose, question and answer session and an open house session. Computers were provided at the meeting for attendees to access the public survey and

to visit the Volusia County Flood Mapping website to determine whether a specific property is located within the floodplain. Public comments were recorded and brought back to the planning team for discussion and review.

The public was also provided the opportunity to comment on the final draft plan through an open survey period. Emails with the plan and survey links were provided to property, business and homeowners who supplied contact information in the initial surveys. A press release was provided to media outlets and all jurisdictions and partnering agencies and stakeholders were provided the link to the survey and document for dissemination to the public and for use on social media outlets. The public comment period was open from June 15th, to July 10th, 2018. Attempts to encourage public input to the planner or Floodplain Management Plan Committee included information distributed through Utility Bills and informational notices posted on webpages. Local television channels, including Channel 13, were provided with press releases of the FMP Public Survey to televise. Additionally, the County has built a web site and links to provide flood and other natural hazard related information.

C. Coordinate

Existing studies, reports, plans and other information were reviewed in the development of this plan. These documents include the Volusia County Local Mitigation Strategy, local Comprehensive Plans, Land Development Codes, Ordinances, and stormwater management plans. During the LMS update of 2014, individual plan updates were reviewed as well to ensure consistency and overlapping projects and priorities. Table 2 illustrates the plans, reports, codes, and other documents within each jurisdiction. *The Volusia County LMS provides more information concerning each plan and its role in emergency management and floodplain management. This information can be found in Section 7: Capability Assessment of the LMS.* Note that as part of the Floodplain Management Plan, this table has been updated and modified from the LMS. It is recommended that during the next update of the LMS, this table be used as a point of update. Note: All jurisdictions, through this FMP have integrated a standalone Floodplain Management Plan.

Jurisdiction	Local Mitigation Strategy	Comprehensive Land Use Plan	Floodplain Management Plan*	Open Space Management Plan		Natural Resource Protection Plan/Policy/Code	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Floodplain Ordinance (or Flood Damage Prevention Ordinance)	Zoning Ordinance	Subdivision Ordinance	Post-disaster Redevelopment / Reconstruction Ordinance / Policy	Building Code	Building Code with FEMA Floodplain Standards (2013)	Fire Code	National Flood Insurance Program
Daytona Beach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Daytona Beach Shores	X	X			X			X		X		X			X	X		X		X	X	X
DeBary	X	X	X	X	X	X	X	X			X	X	X		X	X	X		X		X	X
Deland	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X		X		X	X
Deltona	X	X	X	X	X	X		X	X	X		X	X			X	X	X		X		X
Edgewater	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Holly Hill	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X		X		X	X
Lake Helen	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X		X		X
New Smyrna Beach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Oak Hill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Orange City	X	X	X	X	X		X	X	X	X		X		X		X	X		X		X	X
Ormond Beach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
Pierson	X	X						X		X		X				X			X		X	X
Ponce Inlet	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X		X	X
Port Orange	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X		X
South Daytona	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X
Volusia County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 2: Jurisdictional Plans

Source: Volusia County LMS, 2018

The Planning Team reviewed plans from the County and all jurisdictions for information geared to assist in the data collection, analysis and overall development of this plan. While the Local Mitigation Strategy provided a great deal of information, individual Comprehensive Plans gave the planning team good insight into the policy-driven needs of these jurisdiction from a community resiliency and land use perspective. The datasets compiled from the Future Land Use element of each Comprehensive Plan within the County (city and county) were utilized to create a land-use based GIS analysis in the risk assessment portion of this report. The county Emergency Operations Plan and COOP Plans were also reviewed by the Planning team to ensure the initiative and analyses included in this plan reflect the actual response mechanisms already in place in Volusia County. Of the plans listed above, another crucial piece of information from the jurisdictional level came from building codes and standards located within Land Development Codes.

V. RISK ASSESSMENT

A. Assessing the Hazard

The County consists of approximately 1,210 square miles with 50 miles of Atlantic coastline. Approximately 982 square miles are located in unincorporated areas and 238 square miles are incorporated. On the east side of the County, the Halifax River and the Indian River North/Mosquito Lagoon make up the Intracoastal Waterway and form long, narrow estuaries which separate the mainland from the barrier island. Ponce De Leon Inlet, located near the middle of the coastline, serves as the County's only passage through which ocean tides and hurricane surges pass into the Intracoastal Waterway.

The St. Johns River is the largest river in the County and flows along the west side of the County. The Tomoka River has a tributary area of 159 square miles, which serves the northeastern and central portions of the County. The river flows from south to north and discharges through the Tomoka Basin to the Halifax River, which can be subject to storm surge.

Volusia County's primary and most often occurring hazard is from flooding caused by hurricanes, tropical storms, and subtropical events that are associated with extremely heavy rain. Many areas of Volusia County are

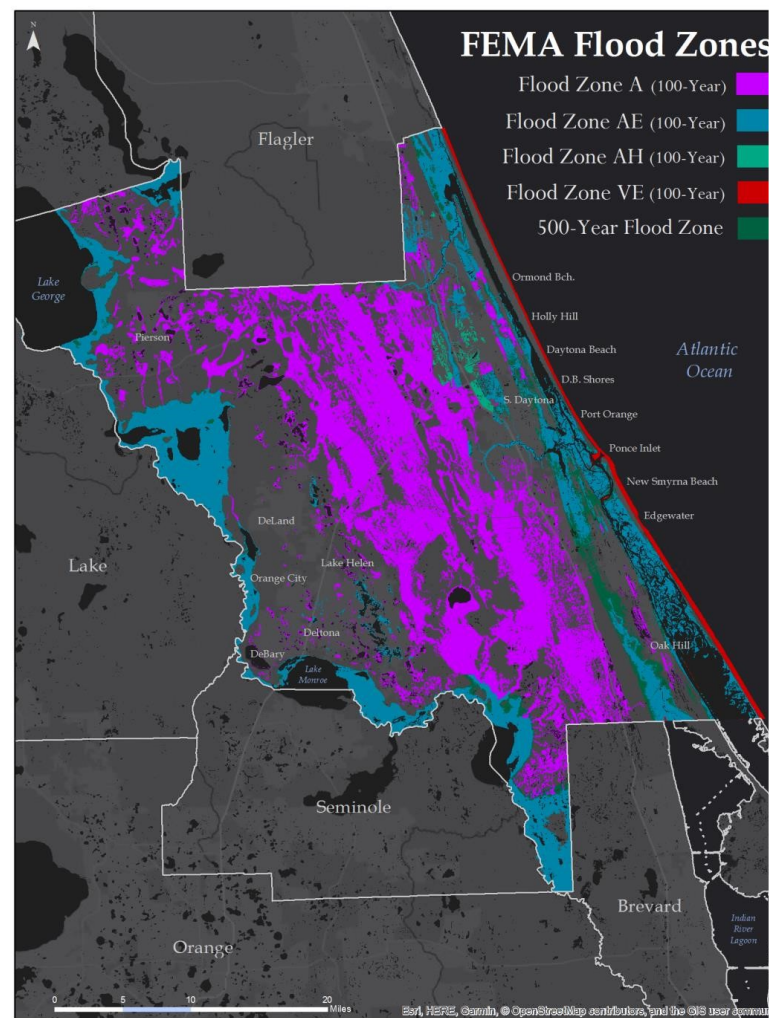


Figure 1: FEMA Flood Zones

susceptible to riverine and urban flooding as well as by storm surge due to coastal storm events. Riverine flooding occurs from the St. Johns River, the Halifax River and the Tomoka River, in addition to associated tributaries and creeks such as Thompson Creek and Laurel Creek in the Ormond Beach area.

Additionally, certain low-lying inland areas in the northwest, north, southeast and southwest are considered flood-prone areas. Many evacuation routes traverse the floodplain and if not mitigated properly (elevated, designed, etc.), could be prone to flooding. The figure on the previous page depicts the Volusia County 2017 DFIRM flood zones throughout the County. The storm surge zone map on the following page visualizes storm surge zones (by hurricane intensity) from the Statewide Regional Evacuation Study for the East Central Florida Region.

Areas vulnerable to flooding are generally located within the floodplain. FEMA updated the Flood Insurance Rate Maps for Volusia County and published them in 2017. Base flood elevations have been calculated in the Flood Insurance Study for Volusia County.

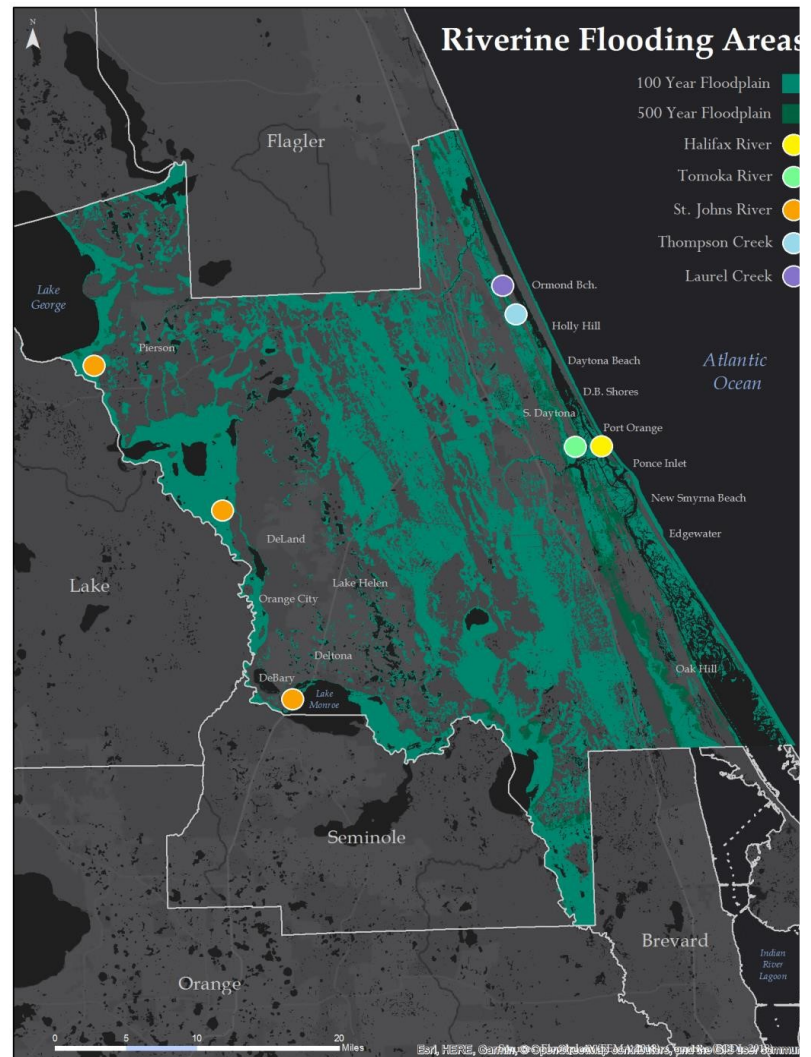


Figure 2: Riverine Flooding Areas

Storm Surge

Coastal flooding caused by tropical storms, hurricanes and unusually high tides combined with strong easterly or northeasterly winds also poses a continuing threat to the County. Storm surge produces most of the flood damage and loss of life associated with storms that make landfall or that closely approach a coastline. Storm surge is the most dangerous hurricane hazard, as 88% of hurricane related deaths are attributed to drowning (Source: National Hurricane Center).

The principal tool utilized in assessing the hazard of storm surge is the Sea, Lake and Overland Surges from Hurricane (SLOSH) model. The computerized SLOSH model predicts the tidal surge heights that result from hypothetical hurricanes with selected various combinations of pressure, size, forward speed, track and winds. The SLOSH model, which is utilized locally for hazard and vulnerability analysis, has been digitized into the County's GIS (Geographical Information System) mapping system. Estimated storm surge heights range from two to four feet in a Category 1 storm to in excess of twenty feet in a Category 5 storm. The table on the following page is from the 2010 Statewide Regional Evacuation Study Program developed for the east central Florida region by the ECFRPC. Through SLOSH Analysis, it was determined that a Category 1 storm surge will produce storm tide heights up to 6 feet. A category 5 storm will produce

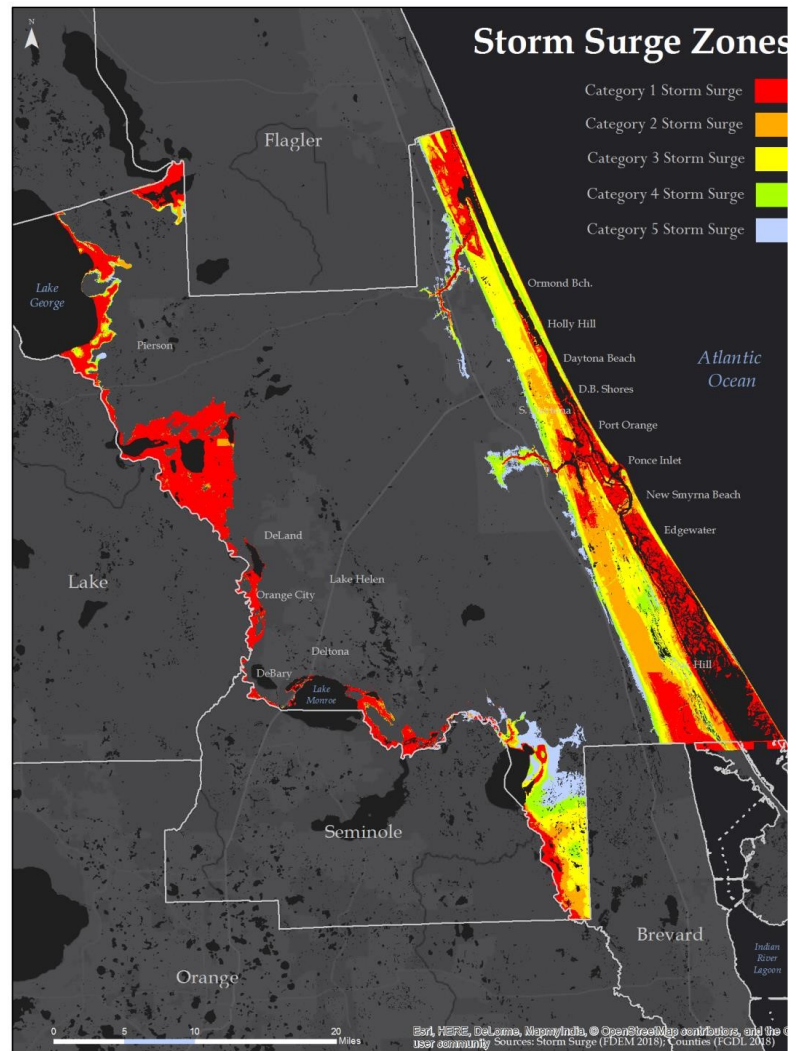


Figure 3: Storm Surge Zones

storm tide heights up to 25 feet. It should be noted again that these surge heights represent the maximum surge height recorded in the county from the storm tide analysis including inland and back-bay areas where the surge can be magnified dependent upon storm parameters.

Since the last FMP update in 2013, two hurricanes have impacted Volusia County. Hurricane Matthew followed a track just off shore of the County (to the east), bringing storm surge, blowing off roofs, downing trees and flooding low-laying areas of the County. Hurricane Irma also impacted the community, bringing large volumes of rain to the County. This rain caused rising waters to infringe near highly sensitive electrical equipment, flooded properties, and widespread lightning. Storm surge from this event flooded beaches, coastal roadways and businesses, and destroyed a boardwalk near Ponce Inlet.

Storm surge also occurred during the 2004 storms: Hurricanes Charley, Frances, and Jeanne. Although no official flooding depth measurements were taken during the 2004 events, it has been estimated that storm surge flooding during the storms caused tidal waters to rise three to five feet above the mean high tide. During Hurricane Frances, over 13 inches of rain fell in the County causing substantial flooding. Over \$390 million worth of damages resulted from wind and flooding impacts. The most recent significant freshwater flooding was a result of the “No-Name” rain event of May 2009 which impacted numerous homes on the east side of the County. This event left some properties in the affected areas two feet under water. In 2008, Tropical Storm Fay caused severe flooding on the west side of the County. Rainfall ranged from 3 inches to over 10 inches along the east coast of Florida. Volusia County reported damages in excess of \$13.5 million.

Since 1965, Volusia County has received numerous disaster declarations for such hazards as hurricanes, tornados, floods and severe freezes. Since 1993, there have been 21 reported flood events in Volusia County. The table on the following page is a list of the severe storm and flooding activation events for the Volusia County Emergency Operations Center. These events include those Presidential Disaster Declarations.

As stated above, riverine and storm-surge induced flooding events can and do occur outside of the 100-year floodplain. Areas where levees and dams are present are also at an increased risk for flooding events, as are areas along the coastline that are within coastal erosion zones. Finally, long term sources of risk such as sea level rise and tsunamis must be included as “lower probability” threats to areas that are not within the floodplain. The last known tsunami-type event occurred in Daytona Beach on July 3, 1992, injuring over 70 individuals. Solutions to these issues can include infrastructure mitigation, shoreline protection and resilient community planning

Table 3: Potential Storm Tide

Hurricane Strength	Volusia Depth
Category 1	Up to 6'
Category 2	Up to 10'
Category 3	Up to 14'
Category 4	Up to 23'
Category 5	Up to 25'

Source: Statewide Regional Evacuation Study (2010)

techniques (including developing in areas that are not prone to flooding). Implementing the principles of smart growth and the clustering of future population centers in non-vulnerable areas will help to lower long term risk to natural hazards such as flooding, storm surge and coastal erosion.

Table 4: Disaster Declarations resulting in Flooding in Volusia County

Date of Event	Type of Event	Area of Event	Damage Estimate	Damage Estimates
			# of Parcels	Dollars
11/17/1994	T.S. Gordon	County-wide	658	\$10,602,924.00
8/3/1995	Hurricane Erin	Edgewater	31	\$65,052.00
7/10/1996	Hurricane Bertha	County-wide	N/A	N/A
9/5/1996	Hurricane Fran	County-wide	N/A	N/A
10/8/1996	T.S. Josephine	County-wide	193	\$1,232,343.00
9/14/1999	Hurricane Floyd	East Side	433	\$18,655,353.00
10/16/1999	Hurricane Irene	East Side	185	\$16,809,266.00
9/16/2000	Hurricane Gordon	County-wide	N/A	N/A
9/14/2001	T.S. Gabrielle	County-wide	44	\$474,135.00
11/15/2001	Rain Event	East Volusia	39	\$561,300.00
9/4/2002	T.S. Edouard	County-wide	N/A	N/A
8/13/2004	Hurricane Charley	County-wide	5,719	\$106,900,000.00
9/4/2004	Hurricane Frances	County-wide	26,964	\$393,900,000.00
9/25/2004	Hurricane Jeanne	County-wide	N/A	\$59,500,000.00
9/8/2005	T.S. Ophelia	County-wide	Beach	N/A
10/23/2005	Hurricane Wilma	County-wide	3	\$752,000.00
8/29/2006	T.S. Ernesto	County-wide	N/A	N/A
8/18/2008	T.S. Fay	County-wide	240	\$13,580,016.00
5/17/2009	May Rain Storm	County-wide	1,654	\$69,516,703.00
10/7/2016	Hurricane Matthew	County-wide	10,041	\$442,509,779
9/11/2017	Hurricane Irma	County-wide	4,808	\$321,038,971

Known Flooding Areas (Countywide)

Figure 3 depicts areas that have been identified by county stakeholders as areas prone to flood damage. These include 1) the Sica Hall Canal; 2) the LPGA Canal; 3) the Nova Canal and 4) the Stone Island community. All of these locations are prone to flooding during relatively moderate rain events. A member of the public also identified Bethune Point Park (near Beville Road) as a known flooding area ([see star on map](#)).

Less Frequent Floods

This plan focuses on four types of less-frequent floods. The following events types are included and assessed:

1. Category 3-5 Hurricanes
2. Drawn-Out Rain Events
3. 500-Year Flood Events

The four known flooding areas shown in the map on this page are susceptible to water intrusion into private property and roadways during all three of the events mentioned above. However, it is particularly during the second event, “drawn out rain events”, where residents are less-prepared to deal with the effects and the damage could be higher than expected. These storm events often last days and steadily accrue a number of inches of rain.

Prep for Less Frequent Flood in Flood-Prone Areas

In best case scenarios, residents in these flood-prone areas prepare for these events using sand bags and other short term, temporary mitigation methods. These techniques are common for hurricane preparations but must be done on the fly during drawn-out rain events.

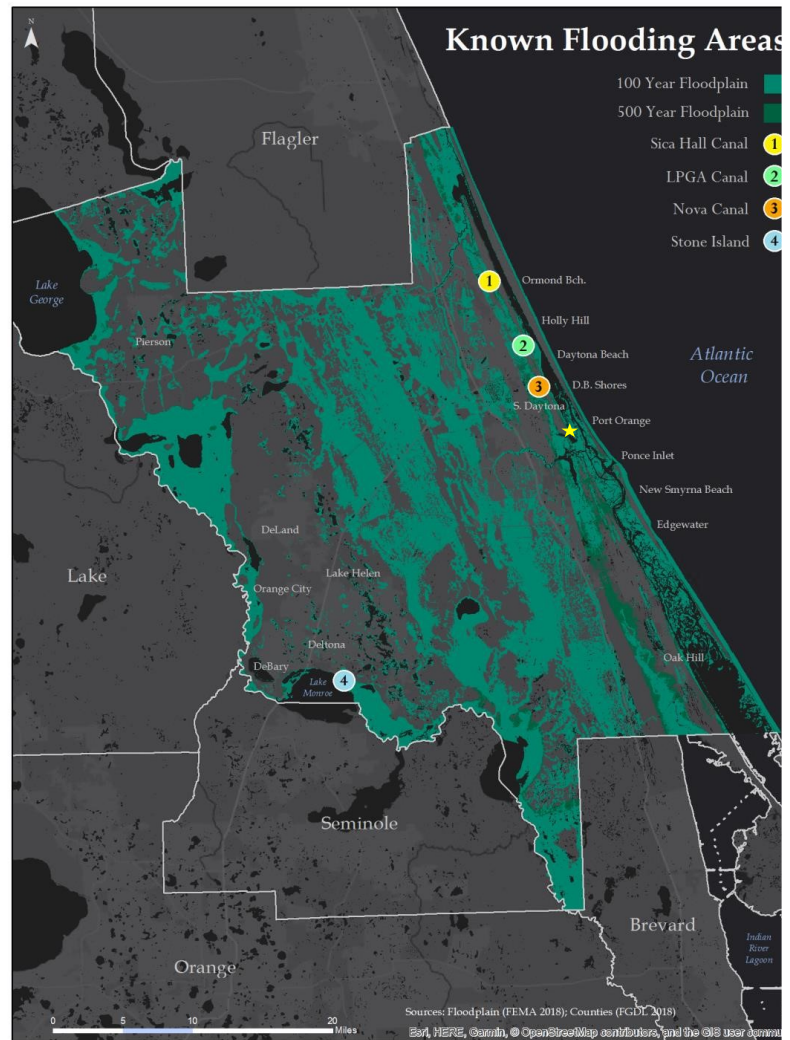


Figure 4: Known Flooding Areas

500 Year Floods

The 500-year flooding event is a third form of a “less frequent flood” that will impact Volusia County at some point in time over the long term. A map of this zone is available to the right.

Long Term Impacts of Sea Level Rise

The frequency of future floods may increase over the long term as sea levels rise along the Atlantic coast and lagoon system. The map below depicts long term hazard zones in the County as determined by NOAA’s Coastal Flood Exposure Mapper. This model takes into account flood zones, sea level rise, storm surge and high tides. The table to the right depicts flooding frequency increases tied to sea level rise.

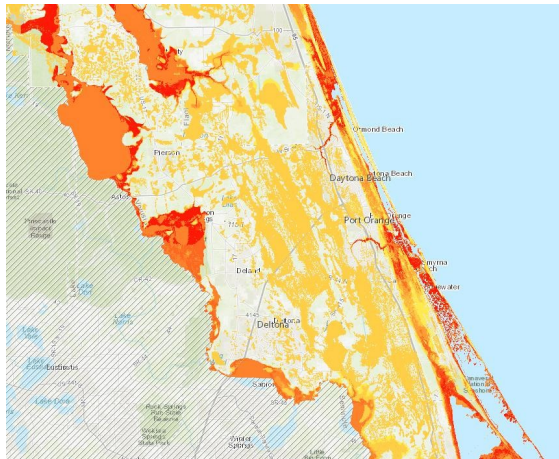


Figure 5: Combined Hazard Zone

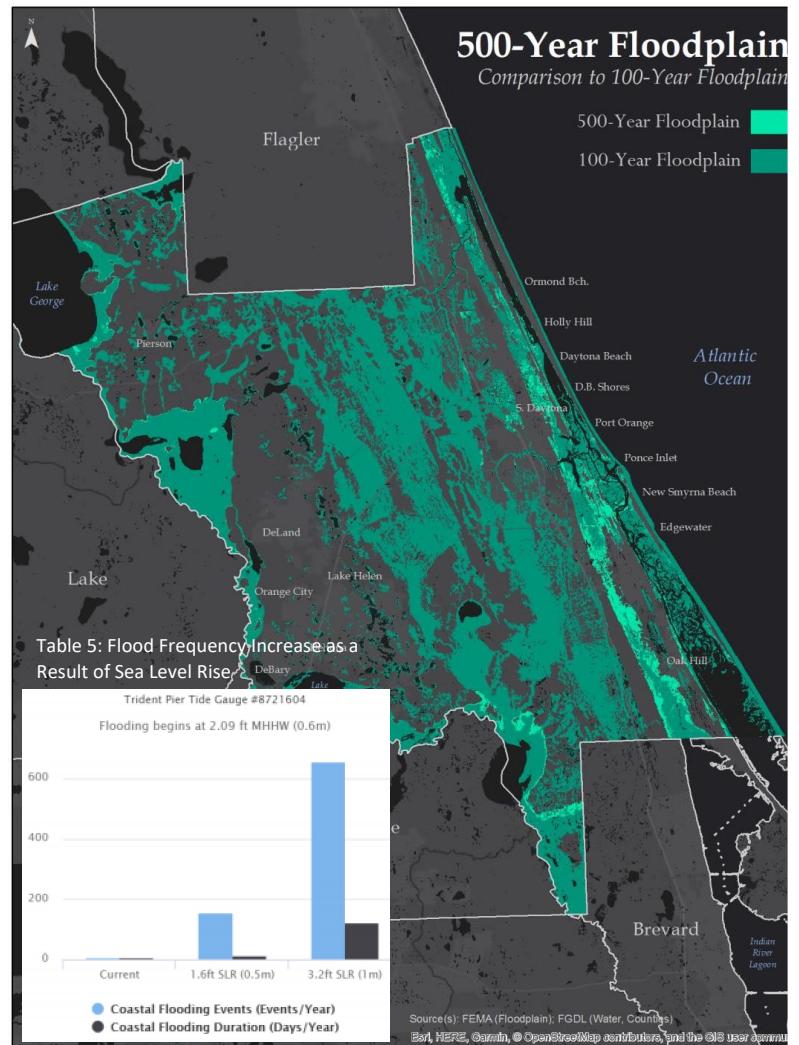


Figure 6: 500 Year Floodplain

Regional and Local Efforts to Plan for Increasing Flood Frequency and Sea Level Rise

Flooding and storms have become more frequent across Florida's coastal communities due to changing climate and sea level rise. Mean elevation for the State of Florida is approximately 100 feet above sea level with the highest point registering at only 345 feet above sea level. In Volusia County, the highest natural point of elevation is 120 feet above sea level. Local governments and residents are starting to see the beginning impacts sea level rise combined with storms will have on their community. As sea level rise continues, it is becoming of critical importance to understand the potential vulnerability of inundation and flooding on communities and infrastructure, specifically those facilities located in low-lying coastal areas. The U.S. Army Corps of Engineers High Projection Rate Curve anticipates sea level rise along Daytona Beach Shores to be 5.15 feet by 2100. This, along with a 100-year storm, could mean devastation to coastal communities if appropriate planning and action is not taken early enough.

The Volusia County Office of Emergency Management in partnership with the East Central Florida Regional Planning Council (ECFRPC), Florida Department of Transportation, the River to Sea Transportation Planning Organization, and UF GeoPlan has taken a deep dive into the assessment of impacts of sea level rise inundation as well as impacts of sea level rise, combined with a 100-year coastal storm. By taking a risk-based approach and identifying vulnerable facilities, agencies and jurisdictions can implement adaptation practices overtime that will protect these facilities and minimize impacts on the community.

The information, data and recommendations developed through these efforts has been made available to communities and agencies throughout Volusia County to aid them in the planning for future conditions related to flooding and sea level rise inundation.

In 2016, the Space Coast Transportation Planning Organization funded a sea level rise analysis for the County to look at impacts from the US Army Corps of Engineer projection rate curves including the high projection rate curve which exceeds the CRS minimum future condition analysis of NOAA 2012 Intermediate-High projection by approximately 1 foot by 2100. The analysis included an assessment of evacuation routes and the major roadway network, evacuation support facilities, scenic byways, railroads, and also addressed impacts to stormwater storage. Numerous recommendations were provided in the report including the adoption of a base sea level rise modeling scenario. This report can be found <https://www.perilofflood.net/projects>.

In 2017, through a Florida Department of Environmental Protection Grant, the VCOEM and partners continued to build on the county's assessment of impacts from flooding and sea level rise. Using the FDOT Sea Level Scenario Sketch Planning Tool along with FEMA's Hazus-MH software, impacts of sea level rise, combined with a 100-year-storm were modeled, along with hypothetical alterations of a historical hurricane under sea level rise scenarios. Using these models and Volusia County data, critical assets such as shelters, airports, power plants, and other critical facilities were assessed to determine potential impacts during such a 100-year storm event with increased coastal flooding.

Assessments also included evacuation routes and property impacts. Potential economic impacts were assessed in terms of property value and damage assessments using HAZUS. The study also looked at the different approaches Volusia County can use to build resiliency including retreat, accommodate, and protect. Resources, along with recommendations for implementing new data and strategies, policies and information into existing plans throughout the county were discussed.

Emphasis was placed on Emergency Preparedness,

Land-Use, and Transportation. The data, resources and recommendations within this report should provide Volusia County with a solid foundation to guide conversations and coordination to determine the appropriate approach in each situation. This report can be found at <https://www.perilofflood.net/projects>.



The frequency of coastal flooding (pictured) is projected to increase with rises in sea levels.

B. Assessing the Problem

1. VULNERABILITY SUMMARY

Table 5 depicts the Hazard Risk Score for each jurisdiction as it concerns flooding and storm surge as per the Local Mitigation Strategy. Each hazard was scored by the jurisdictions based on a number of vulnerability factors including area impacted, health and safety of the population, property, environment, and economic vulnerability. Each hazard was given a score between one and five with five being the greatest. This number was then multiplied by the score of the hazards probability of occurrence (1-5) resulting in a risk rating for each jurisdiction. Additional hazard information can be found in the Volusia County Multi-Jurisdictional Local Mitigation Strategy (LMS), Section 5 – Hazard Profiles. Specific information for Hurricane and Tropical Storms can be found in Section 5.3; Flood can be found in Section 5.10; and Storm Surge can be found in Section 5.11. Section 7.3.4 Floodplain Management describes the Volusia County NFIP actions and the Community Rating System.

The Flood Hazard analysis includes location and spatial extent of the hazard, historical occurrences and impacts, historical summary of insured flood losses, analysis of loss properties and probability of future occurrences.

In order to update the Volusia County Multi-Jurisdictional Local Mitigation Strategy of 2014, a Vulnerability Assessment was updated using HAZUS and MEMPHIS data, as well as the most recent local parcel data for GIS analysis. Hazard maps, hazards exposure and loss estimates were also included. (See Sections 4, 5 and 6 of the LMS for further information.) In addition, each jurisdiction reviewed the hazards scores that were included in the 2005 and 2010 LMS (Comparison of Jurisdictional Relative Risk) and modified the scores for each hazard to reflect changes in the impacted area; probability of occurrence; and affects to the built and natural environment and economy.

As per the 2014 Volusia County FMP, Volusia County's probability of flood occurrences is rated as "high" (expected to occur at least every 5 years). While all 17 jurisdictions in Volusia County participate in NFIP, 10 jurisdictions currently participate in the Community Rating System (CRS): Daytona Beach, Daytona Beach Shores, Deltona, Edgewater, Holly Hill, New Smyrna Beach, Ponce Inlet, Port Orange, South Daytona, and Volusia County.

2. LIFE, SAFETY AND HEALTH

Freshwater flooding along rivers and streams causes significant property damage and has the potential of causing personal injury and deaths. Over the past 20 years, freshwater flooding had become the leading cause of death related to hurricanes. This is due in part to the successful evacuation planning efforts in the United States which had significantly reduced the number of deaths (in the U.S.) related to storm surge until 2005. However, it is also recognized that many coastal and inland residents do not recognize the risk associated with freshwater flooding, especially when driving.

In response, a national program, “Turn Around, Don’t Drown” was implemented in 2002. Typically, the rainfall associated with, and in advance of, a hurricane does not in itself necessitate the emergency evacuation of residents during the passage of a hurricane. Days after a storm however, the coastal flooding and rainfall – particularly from slow moving storms - may cause the evacuation of inland residents as swollen rivers and streams breach their bank or levees. Rainfall may cause the inundation of roadways sought as evacuation routes. In addition, given Florida’s climatology and the normal summer weather, flooding may occur as a disassociated event prior to the hurricane, flooding evacuation routes and saturating the ground. Contingency plans including rerouting, sandbagging and pumping will be coordinated with local and state law enforcement and the State Department of Transportation. Rainwater inundation of evacuation routes must be addressed in an evacuation plan. The planning strategy to address this problem is to plan for the passage of all vehicles over such roadways before substantial rainfall from the hurricane is expected. The Central Florida region is among the fastest growing regions in the nation. Volusia County is located within the northeastern quadrant of this region and has seen a vast increase in population since the late 1970’s. From a safety and health perspective, the locations of new populations migrating to Volusia County over the next few decades would benefit if located away from floodplains. Two strategies to counter human exposure to floodplains include urban infill and increased density near existing transit nodes.

Volusia County Population Counts (US Census, 2016)	
Daytona Beach - 66,645	New Smyrna Beach - 25,796
Daytona Beach Shores - 4,481	Oak Hill - 2,029
DeBary - 20,394	Orange City - 11,403
DeLand - 31,569	Ormond Beach - 42,162
Deltona - 90,124	Pierson - 1,849
Edgewater - 22,077	Ponce Inlet - 3,220
Holly Hill - 12,142	Port Orange - 61,105
Lake Helen - 2,740	South Daytona - 12,789

Health Hazards from Flood Waters and Mold

Volusia County Emergency Management will utilize its social media accounts and local news stations to warn citizens of mold exposure in circumstances involving standing water and drawn-out rain events discussed on page 14. In addition, the study at [this link](#) analyzes the vulnerability of countywide stormwater systems to infringing water. Effective stormwater systems can limit the volume of standing water on public and private property after storm events.

Impact of Hazards on Warning and Evacuation Procedures

The Volusia County Emergency Management twitter account stays engaged with residents before, during and after flood hazard events. In the event of mass communication and power outages in the community, the EOC will communicate with residents via shelter staff and law enforcement as the situation requires. Strong winds can prevent certain actions.

3. CRITICAL FACILITIES

Flooding can have impacts on critical facilities and the ability to respond to emergencies. According to the Florida Division of Emergency Management, "critical facilities" are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided. Shelters, emergency operation centers, public health, public drinking water, sewer and wastewater facilities are examples of critical facilities. Though not explicitly included in the definition, supporting life-line infrastructure essential to the mission of critical facilities must also be included in the inventory when appropriate. All but four jurisdictions in Volusia County has a critical facility within the 100-Year Floodplain or the 500-Year Floodplain. Although several western jurisdictions are low in elevation, a disproportionately high number of critical facilities that are exposed to the floodplain are within a short distance to the Atlantic Ocean or inter-coastal waterway on the east side of the county. A majority of the exposed critical facilities countywide are located east of Interstate-95.

The inundation of critical facilities can have a profound effect on the ability for coordination among county and city planning officials and mitigation activities must provide guidance to avoid 'domino effect' losses from a critical infrastructure perspective. For example, if a critical facility such as the Volusia County EOC is completely destroyed in a disaster, there are a number of other communication and logistical critical facilities that utilize the EOC as a 'home base' for their own activities. In these cases, strategies must be put in place to ensure that backup facilities can manage the loss of core critical infrastructure loss. The East Central Florida Regional Planning Council and Volusia County Emergency Management completed a Continuity of Operations Plan in 2013 for the loss of the Volusia County EOC, while other plans focused on other facilities can strengthen cooperative efforts in the future.

Specific areas of concern from a critical infrastructure and facility perspective include communication towers, water management infrastructure, facilities that double as storm shelters (including schools) and core-logistical facilities (EOC, etc.).

The table on the following page outlines the number of critical facilities exposed to the floodplain, by jurisdiction. Please reference **Appendix A** at the end of this document to view a more detailed listing of exposed critical facilities by jurisdiction.

Volusia County Emergency Management has updated its Critical Facility listing in time for the 2020 Floodplain Management Plan update. The map on this page depicts the flood hazard zones and the locations of vulnerable critical facilities at the countywide scale. Appendix A includes highly detailed maps of critical facility exposure by jurisdiction. The table below summarizes vulnerable facilities by jurisdiction.

Table 6: Vulnerable Critical Facilities by Jurisdiction

Jurisdiction	Vulnerable Critical Facilities	
	100-Yr Floodplain	500-Yr Floodplain
Daytona Beach	35	47
Daytona Beach Shores	0	0
DeBary	0	0
DeLand	1	1
Deltona	2	2
Edgewater	0	2
Holly Hill	9	16
Lake Helen	0	0
New Smyrna Beach	7	31
Oak Hill	8	8
Orange City	0	0
Ormond Beach	15	18
Pierson	1	1
Ponce Inlet	1	3
Port Orange	5	10
South Daytona	1	7
Unincorporated	41	48
Countywide	126	194

Source(s): Volusia County E.M (Facilities); FEMA (Floodplain)

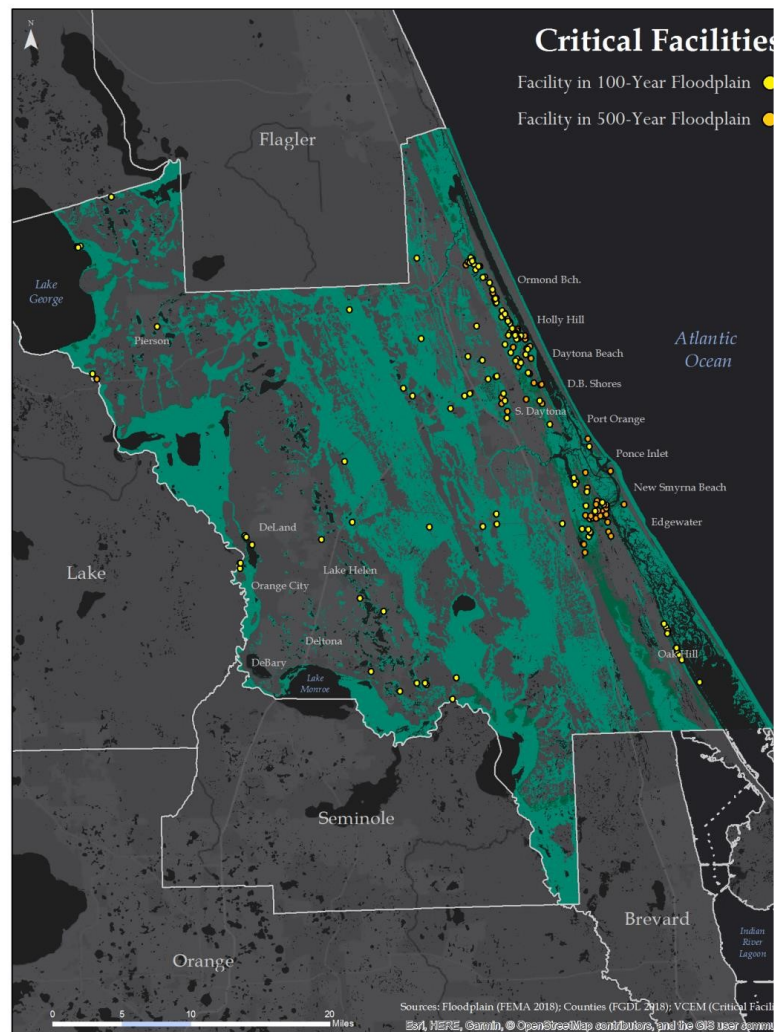


Figure 7: Critical Facilities

4. ECONOMIC ANALYSIS

Analysis of the financial values of all parcels exposed to the 100-Year Floodplain in Volusia County revealed that approximately 17 billion dollars in property value is located (partially or completely) within the 100-Year Floodplain. Of these parcels, 44.0% are considered “low value” parcels (valued under \$50,000) while only 1.85% of parcels are valued over one million dollars.

The VE floodplain zone, a specific portion of the 100-year floodplain, is located along the coastal area and includes properties that are subject to flooding from velocity occurrences such as wave action.

The following data summarizes the exposure within the 100-year flood zone.

- **Land Value:** \$6,457,318,636
- **Assessed Value:** \$17,677,741,449
- **Taxable Value:** \$12,552,049,286

While the VE zone is located near coastal areas, much of the 100-year floodplain is located within inland portions of the county. Please reference the table on the following page to view cumulative financial exposure to the entire 100-year floodplain (all zones), by jurisdiction.

As shown in the map to the right, properties in coastal areas of eastern Volusia County are among the most vulnerable on a value per square foot basis.

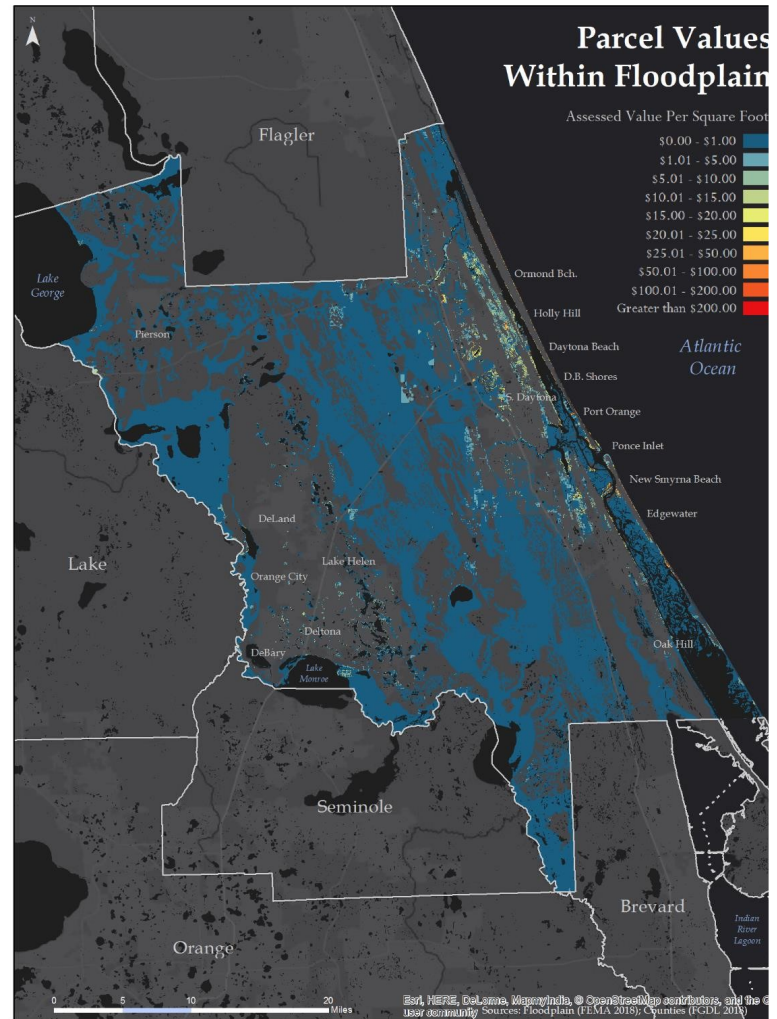


Figure 8: Parcel Values within Floodplain

Table 7: Total Financial Exposure to 100-Year Floodplain

Municipality	Parcels in Floodplain	Buildings in Floodplain	Land Value in Floodplain	Assessed Value in Floodplain	Taxable Value in Floodplain	Building Value in Floodplain
Daytona Beach	14,872	8,770	\$1,031,935,148	\$3,626,954,919	\$2,317,906,555	\$2,492,556,826
Daytona Beach Shores	4,955	132	\$408,090,848	\$1,442,221,431	\$1,332,476,443	\$995,734,555
DeBary	1,457	1,095	\$93,671,202	\$263,763,736	\$191,512,792	\$162,003,662
DeLand	215	121	\$36,181,192	\$112,726,316	\$50,845,772	\$71,983,599
Deltona	5,646	4,524	\$122,580,488	\$711,052,496	\$398,048,314	\$563,266,460
Edgewater	899	644	\$131,100,527	\$244,402,829	\$161,654,623	\$108,511,438
Holly Hill	3,007	2,102	\$112,732,648	\$433,456,264	\$342,878,826	\$315,339,218
Lake Helen	284	140	\$14,937,971	\$38,079,497	\$23,442,299	\$21,641,857
New Smyrna Beach	8,370	3,618	\$926,691,147	\$2,402,551,188	\$1,928,001,263	\$1,409,897,440
Oak Hill	607	399	\$67,278,856	\$106,502,626	\$61,701,575	\$36,099,228
Orange City	72	33	\$27,650,938	\$116,356,750	\$80,042,861	\$85,525,073
Ormond Beach	4,541	3,235	\$576,874,554	\$1,558,730,380	\$1,243,135,285	\$853,502,766
Pierson	162	70	\$7,777,178	\$16,874,499	\$9,865,908	\$8,429,260
Ponce Inlet	1,936	328	\$268,287,790	\$652,777,628	\$538,859,301	\$377,696,350
Port Orange	5,185	4,496	\$323,141,861	\$1,099,399,477	\$808,861,362	\$745,005,376
South Daytona	2,648	2,262	\$135,742,067	\$452,465,156	\$324,926,657	\$304,715,096
Unincorporated	34,172	10,229	\$2,172,644,221	\$4,399,426,257	\$2,737,889,450	\$2,111,056,027
Countywide	89,028	41,928	\$6,457,318,636	\$17,677,741,449	\$12,552,049,286	\$10,662,964,231

An analysis of previous flood zones showed considerable growth of the area located within the floodplain from 2007 to 2017. Newly exposed areas can be viewed on the map to the right (light green).

A considerable amount of expansion has occurred in northeastern Volusia County in the Ormond Beach, Holly Hill, Daytona Beach and Daytona Beach Shores areas. This floodplain growth increases financial liability within the county, as a number of the parcels in these areas are developed. A substantial amount of expansion of the floodplain also occurred in the central portions of the county to the east of Lake Helen and to the northeast of Deltona. Parcels in this area are primarily undeveloped and have future land uses that do not allow future development for the most part. Within Deltona, Orange City, DeBary, Lake Helen and portions of Southern DeLand, the floodplain has expanded primarily in areas in close proximity to lakes and other water bodies.

Volusia County is also susceptible to increases in the size of the 100-year Floodplain as a result of rising sea levels. This would primarily affect parcels in close proximity to the coast, lagoon and inland rivers.

Floodplain Size Comparison

2007 DFIRM – Volusia County: 406,303 Acres

2017 DFIRM – Volusia County: 417,939 Acres (+2.9%)

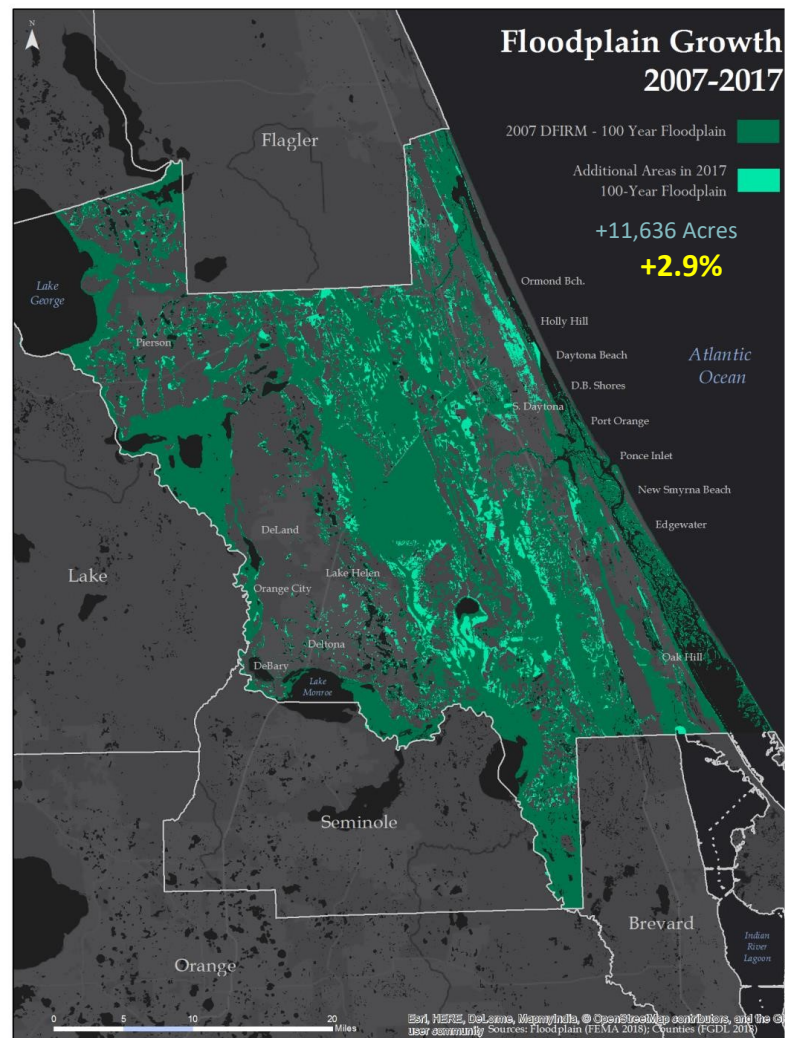


Figure 9: Floodplain Growth

5. PROPERTY ANALYSIS

An analysis of properties located totally, or in part, within the floodplain reveals that 30.9% of all parcels countywide are located in the floodplain, totaling 41,928 structures. This includes 10,229 structures within unincorporated Volusia County and 31,699 structures in all other municipalities combined. It is important to note that 52.9% of the parcels exposed to the floodplain are undeveloped, while built parcels represent a full spectrum of development from the 1940's and forward.

The table on the next page breaks down the year built of all buildings within the 100 year floodplain, by jurisdiction.

Key Dates Include:

The following dates are important from a building code perspective, as parcels built before or after these dates had different requirements at the time of construction.

1968

Federally-backed flood insurance became available to all Americans.

1986

The County Stormwater Management ordinance was amended, enacting minimum design standards.

2002

The Florida building code went into effect.

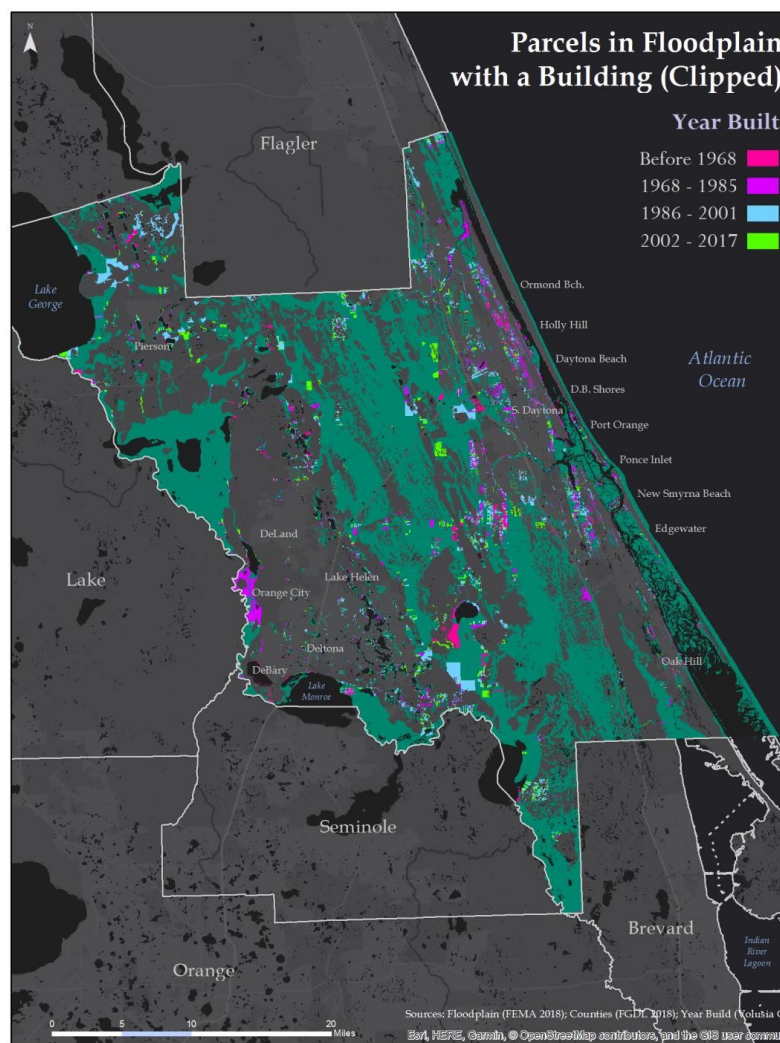


Figure 10: Buildings in the Floodplain

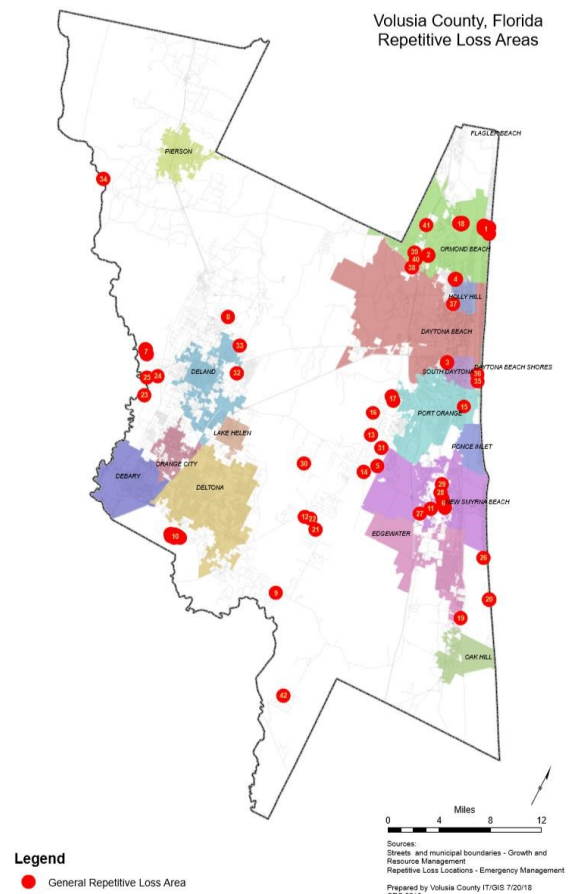
Table 8: Year Built of Structures in the 100-Year Floodplain

Municipality	# Parcels in Floodplain	% Parcels in Floodplain	Buildings in Floodplain	% Parcels Not Built	# Built < '68	# Built '68 - '85	# Built '86-'01	# Built '02-'13
Daytona Beach	14,872	49.6%	8,770	59.0%	3,138	2,915	1,634	1,083
Daytona Beach Shores	4,955	74.9%	132	97.3%	54	56	10	12
DeBary	1,457	14.2%	1,095	24.8%	192	234	411	258
DeLand	215	1.6%	121	43.7%	6	9	28	78
Deltona	5,646	14.5%	4,524	19.9%	146	1,200	2,137	771
Edgewater	899	8.0%	644	28.4%	115	204	202	123
Holly Hill	3,007	51.0%	2,102	30.1%	941	715	253	193
Lake Helen	284	16.9%	140	51.4%	67	32	25	16
New Smyrna Beach	8,370	41.5%	3,618	56.8%	709	1,049	1,191	669
Oak Hill	607	34.8%	399	34.3%	45	160	88	106
Orange City	72	1.8%	33	54.2%	4	4	11	14
Ormond Beach	4,541	22.9%	3,235	28.8%	468	1,173	1,121	473
Pierson	162	13.0%	70	56.8%	29	23	12	6
Ponce Inlet	1,936	53.5%	328	83.1%	34	166	70	58
Port Orange	5,185	21.4%	4,496	13.3%	548	1,739	1,403	805
South Daytona	2,648	46.5%	2,262	14.6%	653	1,128	383	98
Unincorporated	34,172	38.3%	10,229	70.1%	1,653	3,588	3,068	1,922
Countywide	89,028	30.9%	41,928	52.9%	8,801 21.0%	14,395 34.3%	12,047 28.7%	6,685 15.9%

6. REPETITIVE LOSS ANALYSIS

There are repetitive loss properties within 14 of the 16 jurisdictions within Volusia County. These properties have experienced an average of 2.62 flood events per property. Countywide distribution of repetitive loss properties is somewhat weighted to the east, as a majority of the repetitive loss properties in the county are in the Daytona Beach, New Smyrna Beach and Ormond Beach areas. The western side of the county also has a number of repetitive loss properties, most notably the cluster within the Stone Island residential area in the southwestern portion of the county.

Previously collected data showed that the majority of properties have not undergone mitigation efforts; however there is insufficient data to measure an actual percentage for the entire county. Internal County data shows that the percent of repetitive loss properties that have been mitigated is below the 50% level.



Mitigation Strategy for Repetitive Loss Properties

The Volusia Prepares working group, mentioned previously in this plan, prioritizes mitigation projects among the county and all municipalities through the Action Plan.

Of the many project types included in the Action Plan is the mitigation of repetitive loss properties by raising the properties or through other measures. These properties are often mitigated with funds from the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP).

For a listing of the repetitive loss properties that have been given a priority for mitigation by the Volusia Prepares working group, reference the Action Plan in Appendix G.

7. FLOOD CLAIM ANALYSIS

All jurisdictions in Volusia County participate in the National Flood Insurance Program (NFIP) and 10 participate in the Community Rating System (CRS) program as noted in Table 2. The number of flood insurance policies county-wide totals 11,914. The table below breaks down the number of flood insurance policies, claims and claims paid by jurisdiction during the year from 1978 to 2009 and from 2010 to 2017.

There have been 1,560 flood losses reported in Volusia County through the NFIP from 1970 through November 2017, totaling more than \$35 million in claims payments. Since 1978, \$27,726,387 has been paid back in claims. All flooding event types are included.

It is also important to note that these numbers include only those losses to structures insured through NFIP policies and for which claims were sought and received. Following the 2004 hurricanes, 1,106 claims totaling \$14.3 million were paid in Volusia County. The 2016 and 2017 hurricane seasons also resulted in claims being paid to policyholders.

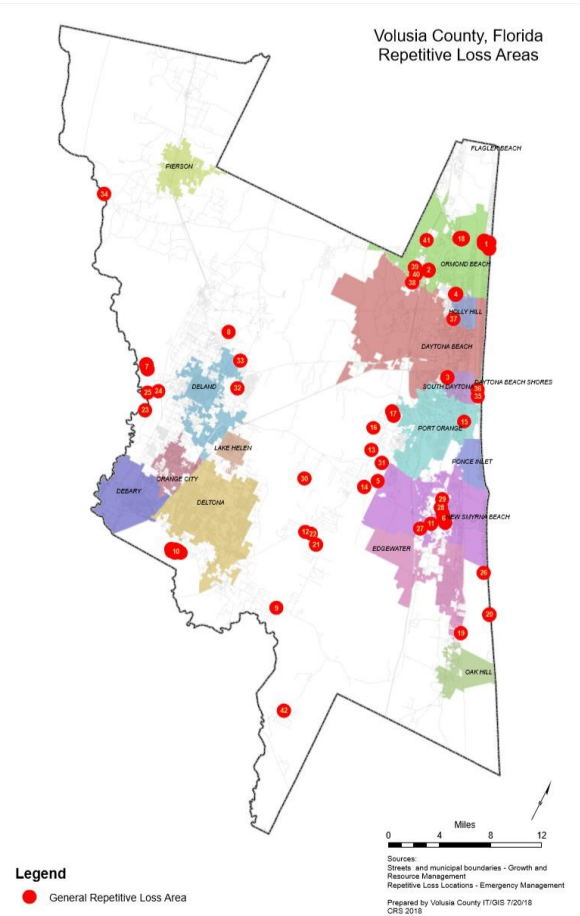


Figure 12: Flood Insurance Policies and Claims

Jurisdictional Flood Claim Information

Flood claim and repetitive loss property information is compiled by FEMA and individual municipalities. Please refer to the individual municipal contacts on page 2 of this plan for more information by jurisdiction.

8. NATURAL PROTECTION

The Volusia County Comprehensive Plan and jurisdictional comprehensive plans all include a conservation element which aims to prevent the degradation of water bodies, wetlands, rivers, estuaries and essential upland areas. Goals and policies in the conservation elements include the protection of surface water resources and the floodplains associated with the water sources, including limiting dwelling unit densities within the floodplains and flood-prone areas. The County and the jurisdictions recognize the importance wetlands and floodplains of surface water bodies play in protecting uplands.

To this effect, the protection of undisturbed segments of floodplains associated with surface water bodies shall continue through land use controls, conservation easements, public acquisition and other methods. These and other policies in the Comprehensive Plans aim to protect and utilize physical and ecological functions of natural drainage ways and patterns to protect developed areas from flood impacts. Wetland and easements maintained along water bodies not only serve as flooding buffers to development but also provide habitat for various species which may otherwise be displaced through fill and development.

According to the analysis performed using GIS, 211,943 acres of existing conservation land in Volusia County is

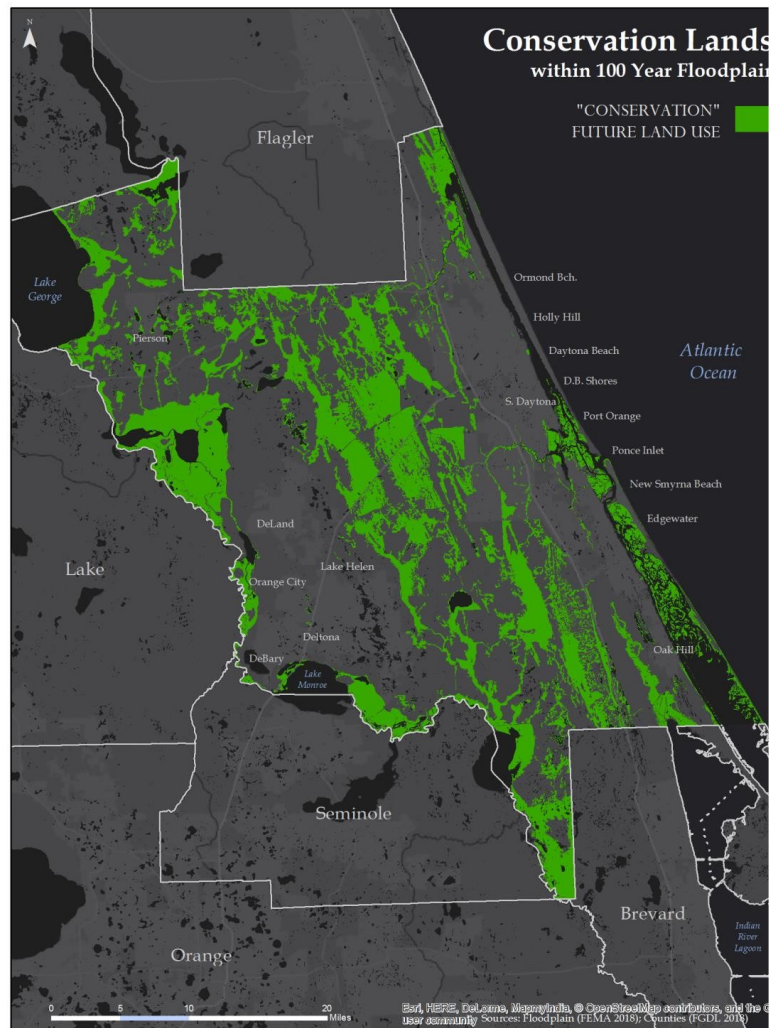


Figure 13: Conservation Lands in the Floodplain

exposed to the 100-year floodplain. Using the size of the countywide floodplain, this means that 50.7% of the 100-year floodplain has a conservation future land use within Volusia County. This would be inclusive of all types of conservation properties such as wetlands and other floodplain areas. It should be the goal of all jurisdictions within the County to maximize the amounts of undeveloped lands in the floodplain with a conservation future land use. This would ensure that development does not infringe into the floodplain.

9. LAND USE AND TREND ANALYSIS

Table 12 below summarizes the total allocation of Future Land Use Designations by acreage of all parcels exposed to the 100-Year Floodplain in Volusia County. A majority of the exposed developed parcels are categorized as “Low Density Residential” (52.9% of exposed built parcels), up slightly from 52.0% in 2012. It is important to note that conservation lands were removed from the Future Land Use analysis to provide a separate analysis. The residential numbers above also exclude agriculture and recreational lands.

Population and Development Trends

Volusia County Population, 2000: 445,060

Volusia County Population, 2010: 494,610 (+11.1%)

Volusia County Population, 2017: 538,692 (+8.9%)

**Source: US Census Bureau (2017)*

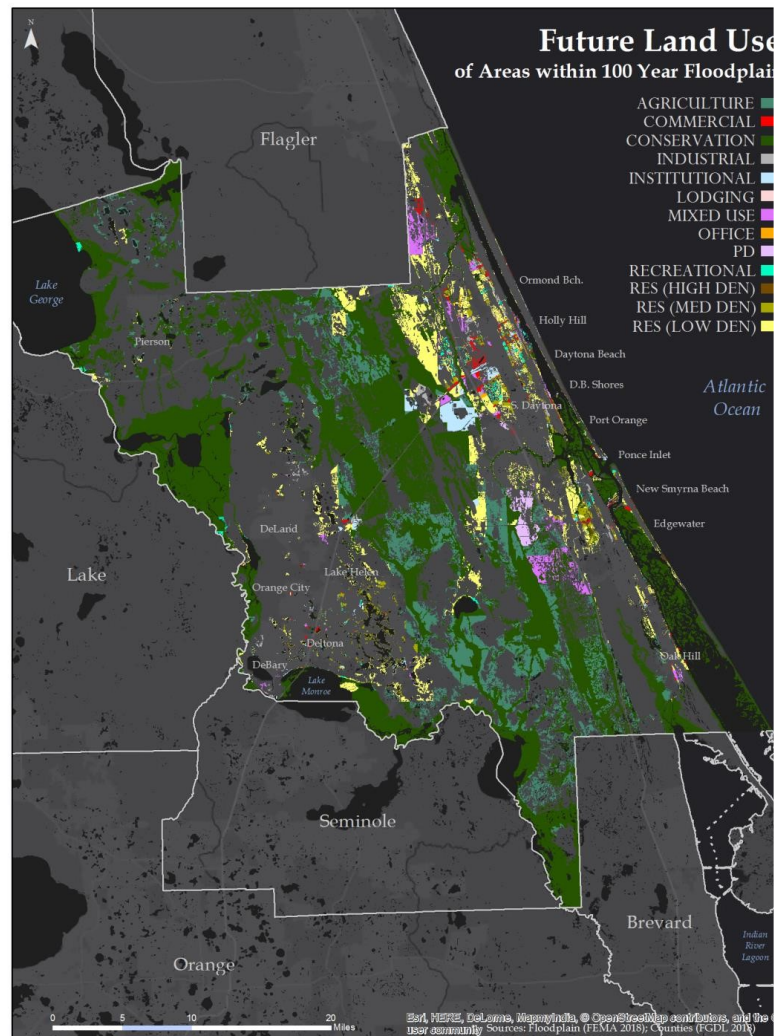


Figure 14: Future Land Uses in the Floodplain

Table 11: Analysis of Acreage of Future Land Uses Located within the 100 Year Flood Plain

*** Note: "Commercial" includes the "Office" and "Lodging" future land use designations*

Municipalities	Low Res.	M-H Res.	Commercial	Mixed Use	Institutional	Industrial	PD	Agriculture	Recreation
Daytona Beach	6951	851	1188	882	309	968	-	-	832
Daytona Beach Shores	1	26	-	-	0.1	-	-	-	-
DeBary	215	54	61	73	65	147	-	144	-
DeLand	300	2	-	111	1	212	-	-	-
Deltona	920	2627	106	67	372	-	-	154	95
Edgewater	280	166	16	1982	57	86	-	-	15
Holly Hill	414	36	24	0.3	10	142	-	-	81
Lake Helen	200	-	-	10	5	2	-	-	-
New Smyrna Beach	1075	643	220	222	23	180	1873	1844	152
Oak Hill	185	42	54	182	13	-	-	200	0.4
Orange City	6	0.2	25	49	38	0.6	-	-	-
Ormond Beach	1780	171	391	1593	71	154	-	-	63
Pierson	5	-	-	-	-	-	-	186	5
Ponce Inlet	86	26	20	-	40	-	-	-	11
Port Orange	1145	611	154	87	254	116	159	-	-
South Daytona	172	207	26	52	21	38	-	-	39
Unincorporated	11982	827	138	72	3180	227		45273	424
Countywide	25717	6289	2423	5382	4459	2273	2032	47,801	1717

The following map shows the evacuation routes and storm shelter locations as identified by the Statewide Regional Evacuation Study (SRES). It is important to note that shelters located within a floodplain may be inaccessible to the public during flooding events, either due to property flooding or the flooding of access roads. The analysis showed that only three shelters are located within the 100-year floodplain.

The following evacuation routes are primary movers of traffic out of Volusia County:

- Interstate 4 (to Orlando)
- Interstate 95 (to Miami, Jacksonville)
- State Road 40 (to Lake County)
- State Road 415 (to Sanford)
- U.S. 1 (coastal)

The table on the following page lists all of the designated storm shelters in Volusia County.

In the event of a mass-evacuation situation in Volusia County, the roadways utilized to reach these storm shelters could become damaged or inundated by water, thus creating the need for mitigation activities that would identify shelters that have additional capacity or those that can serve excess capacity from an inundated shelter.

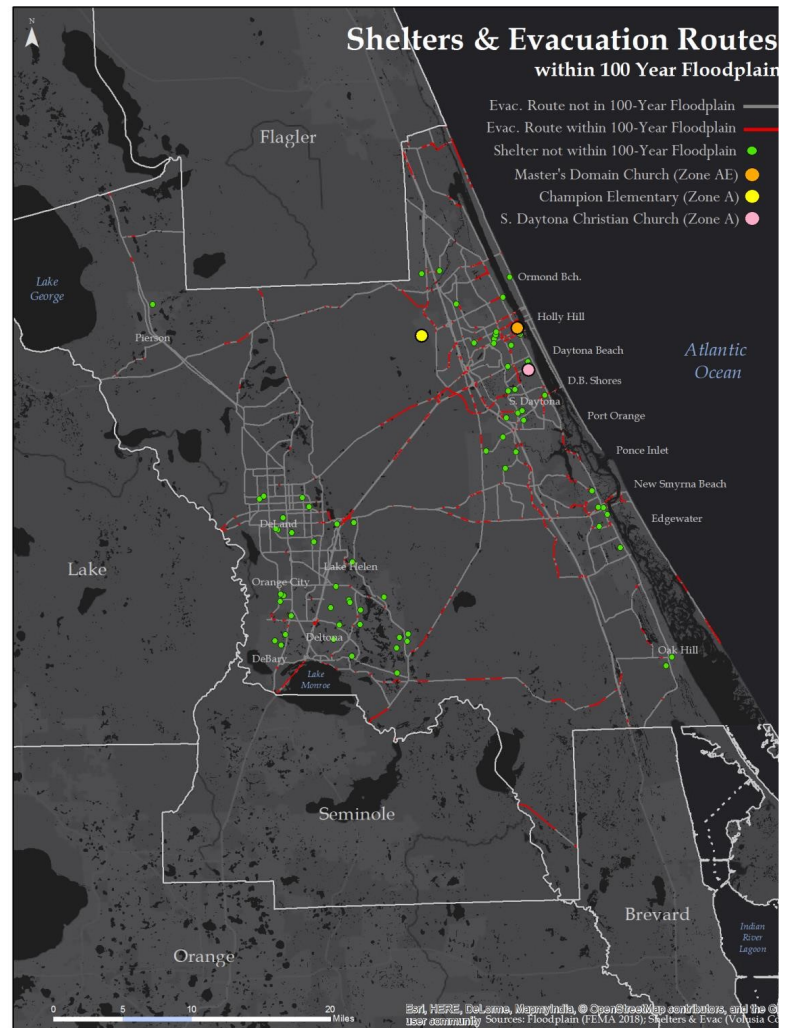


Figure 15: Shelters and Evacuation Routes in the Floodplain

Table 12: List of Storm Shelters in Volusia County (2018)

Shelter Name	City	Evac.	Flood Zone	Surge Zone
ALLEN GREEN CIVIC CENTER	Port Orange			
ATLANTIC HIGH SCHOOL	Port Orange			
BABE JAMES COMMUNITY CENTER	New Smyrna Bch.	B	500 Year	3
BIBLEWAY CHURCH OF GOD IN CHRIST	Oak Hill	C		3
BLUE LAKE ELEMENTARY SCHOOL	DeLand			
CAMPBELL MIDDLE SCHOOL	Daytona Beach	E		4
CHAMPION ELEMENTARY SCHOOL	Daytona Beach		A	
CHISHOLM COMMUNITY CENTER	DeLand			
CITRUS GROVE ELEMENTARY SCHOOL	DeLand			
COVENANT UNITED METHODIST CHURCH	Port Orange			
CREEKSIDE MIDDLE SCHOOL	Port Orange	E		
CYPRESS CREEK ELEMENTARY SCHOOL	Port Orange	E		4
DAYTONA CHRISTIAN & MISSIONARY CHURCH	Daytona Beach			
DAYTONA STATE COLLEGE - DAYTONA BEACH	Daytona Beach			
DAYTONA STATE COLLEGE - DELAND	Unincorporated			
DEBARY ELEMENTARY SCHOOL	DeBary			
DELAND HIGH SCHOOL	DeLand			
DELAND MIDDLE SCHOOL	DeLand			
DELTONA HIGH SCHOOL	Deltona			
DELTONA LAKES ELEMENTARY SCHOOL	Deltona			
DISCOVERY ELEMENTARY SCHOOL	Deltona			
EDGEWATER YMCA	Edgewater	C		3
EMMAUS LUTHERAN CHURCH	Orange City			
FIRST BAPTIST CHURCH OF DEBARY	DeBary			
FIRST BAPTIST CHURCH OF OAK HILL	Oak Hill	D		3
FIRST CHRISTIAN CHURCH	Daytona Beach	C	500 Year	3
FIRST CHURCH OF THE NAZARENE	New Smyrna Bch.	C	500 Year	3
FLORIDA COAST TO COAST RED CROSS CHAPT.	Daytona Beach	E		5
FOREST LAKE ELEMENTARY SCHOOL	Unincorporated			
FREEDOM ELEMENTARY SCHOOL	DeLand			
FRIENDSHIP ELEMENTARY SCHOOL	Deltona			
GALAXY MIDDLE SCHOOL	Deltona			
HERITAGE MIDDLE SCHOOL	Deltona			
HINSON MIDDLE SCHOOL	Daytona Beach			
HORIZON ELEMENTARY SCHOOL	Port Orange			
JAMES PARK YOUTH ACTIVITY CENTER	South Daytona	E		4
LIBERTY INDEPENDENT BAPTIST CHURCH	Unincorporated			

Shelter Name	City	Evac.	Flood Zone	Surge Zone
LIVE OAK GYM	New Smyrna Bch.	C		3
MAINLAND HIGH SCHOOL	Daytona Beach			
MANATEE COVE ELEMENTARY SCHOOL	Orange City			
MASTER'S DOMAIN CHURCH OF GOD IN CHRIST	Daytona Beach	C	AE	3
MOUNT CALVERY FREE WILL BAPTIST CHURCH	Unincorporated			
NEW SMYRNA BEACH HIGH SCHOOL	New Smyrna Bch.	C		3
OSTEEN ELEMENTARY SCHOOL	Unincorporated			
OUR SAVIOR'S EVANG. LUTHERAN CHURCH	Port Orange			
PALM TERRACE ELEMENTARY SCHOOL	Daytona Beach			
PATHWAYS ELEMENTARY SCHOOL	Ormond Beach			
PIGGOTTE COMMUNITY CENTER	South Daytona	E		4
PINE RIDGE HIGH SCHOOL	Deltona			
PINE TRAIL ELEMENTARY SCHOOL	Ormond Beach			
PORT ORANGE ELEMENTARY SCHOOL	Port Orange	C		3
PORT ORANGE YMCA	Port Orange			
PRIDE ELEMENTARY SCHOOL	Deltona			
RIVER SPRINGS MIDDLE SCHOOL	Orange City			
SAINT ANN'S CATHOLIC CHURCH	DeBary			
SEABREEZE SENIOR HIGH SCHOOL	Daytona Beach	A		4
SICA HALL COMMUNITY CENTER	Holly Hill	E		4
SOUTH DAYTONA CHRISTIAN CHURCH	South Daytona	C	A	3
SOUTHWESTERN MIDDLE SCHOOL	Unincorporated			
SPIRIT ELEMENTARY SCHOOL	Deltona			
SPRUCE CREEK BAPTIST CHURCH	Unincorporated	E		5
ST MARYS EPISCOPAL CHURCH	Daytona Beach	E		4
SUNRISE ELEMENTARY SCHOOL	Deltona			
SWEETWATER ELEMENTARY SCHOOL	Port Orange			
T. DEWITT TAYLOR MIDDLE/HIGH SCHOOL	Pierson			
TIMBERCREST ELEMENTARY SCHOOL	Deltona			
TRINITY ASSEMBLY OF GOD	Deltona			
TRINITY EVANGELICAL LUTHERAN CHURCH	New Smyrna Bch.	C		3
TUBMAN KING COMMUNITY CHURCH	Daytona Beach	E		4
UNIVERSITY HIGH SCHOOL	Orange City			
VOLUSIA COUNTY FAIRGROUNDS (PF)	Unincorporated			
VOLUSIA PINES ELEMENTARY SCHOOL	Lake Helen			
WES CRILE GYMNASIUM	Deltona			

VI. MITIGATION STRATEGY

Flood Mitigation specifically involves the managing and controlling of flood movement in an effort to prevent and control flooding. Flood mitigation is any action taken to reduce risk to people or property from flooding and its effects. The Volusia County Multi-jurisdictional Local Mitigation Strategy (LMS) has evolved over the years and not only focuses on flooding, but other natural hazards. The Volusia Prepares LMS Working Group (LMS Working Group) has developed Bylaws and Operating Procedures to formalize the LMS update process and working group. The Plan documents and represents the County's and participating local jurisdictions' sustained efforts to incorporate hazard mitigation principles and practices into the routine government activities and functions of Volusia County and its participating jurisdictions and partners. This includes documenting the goals and objectives that Volusia County deems necessary to protect people and property from hazards. At its most inner core, the Plan recommends specific actions to combat hazard vulnerability and protect its residents from losses to those hazards that pose the greatest risk.

A. Setting Goals

The Floodplain Management Plan Committee reviewed the goals of the current Volusia County FMP and the Local Mitigation Strategy. The following goals and objectives were adopted for the 2020 Volusia County Floodplain Management Plan.

GOAL 1 - Prevent new development in the floodplain from increasing runoff and resulting in increases in flood volumes in the floodplain.

Objective 1.1 Enforce the building requirements, from the National Flood Insurance Program and not allow variances that are feasibly avoidable.

Objective 1.2 Ensure any new development in the floodplain is in accordance with county or municipal ordinances.

Objective 1.3 Minimize flood hazards and protect water quality county-wide by employing watershed-based approaches that balance environmental, economic, and engineering considerations.

Objective 1.4 Protect environmentally sensitive lands and aquifers to maximize their survivability from known flood hazards where appropriate and financially feasible.

Objective 1.5 Reduce flood exposure and maximize flood protection efforts.

Goal 2 – Develop and maintain a proactive public awareness and outreach that informs and notifies property owners that they are located in a flood zone and provides assistance and information regarding flood zones, protection of property, local drainage and sewer back-up problems.

Objective 2.1 Create easily accessible information to educate residents about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains.

Objective 2.2 Encourage land and water uses compatible with the protection of environmentally sensitive lands and coastal resources.

Objective 2.3 Review the adequacy and completeness of emergency procedures that address catastrophic flood events and every year conduct a test of the flood warning system.

Objective 2.4 Minimize impacts from flooding in FEMA designated special flood hazard areas (i.e. flood zones starting with the letters “V” or “A”) where financially feasible.

Objective 2.5 Build a constituency that desires to see the plan's recommendations implemented.

Objective 2.6 Provide leadership in protecting low-income properties and public housing from the impacts of floods.

Goal 3 - Continue with the Hazard Mitigation Grant Program to identify and obtain funding for both pre-and-post disaster residential mitigation projects regarding flooding.

Objective 3.1 Continue to identify cost-beneficial residential units for various flood mitigation grants.

Objective 3.2 Continue to utilize “Volusia Prepares” Local Mitigation Strategy to guide and assist the County and municipalities in establishing priorities for hazard mitigation projects.

Goal 4 – Reduce the number of repetitive loss properties within Volusia County.

Objective 4.1: Mitigate identified repetitive loss properties through the HMGP funding program when possible.

Goal 5 - Review the locations and effects on areas that experience flooding and determine what steps, if any, the County and municipalities can take to alleviate future impacts.

Objective 5.1 Maintain a database of flood problems and hazards, mitigation and repetitive loss claim history.

Objective 5.2 Build public and political support for projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.

Objective 5.3 Continue to prioritize capital projects that will mitigate flood impacts in those areas of the County and municipalities that have experienced significant flooding problems.

Objective 5.4 Continue and enhance existing programs that acquire wetland areas for passive recreation uses while providing significant watershed volume storage and buffer areas from the floodplain.

VIII. MITIGATION ACTIVITIES

Flood Mitigation specifically involves the managing and controlling of flood movement in an effort to prevent and control flooding. Flood mitigation is any action taken to reduce risk to people or property from flooding and its effects. The Volusia County Multi-jurisdictional Local Mitigation Strategy (LMS) has evolved over the years and not only focuses on flooding, but other natural hazards. The Volusia Prepares LMS Working Group (LMS Working Group) has developed Bylaws and Operating Procedures to formalize the LMS update process and working group. The Plan documents and represents the County's and participating local jurisdictions' sustained efforts to incorporate hazard mitigation principles and practices into the routine government activities and functions of Volusia County and its participating jurisdictions and partners. This includes documenting the goals and objectives that Volusia County deems necessary to protect people and property from hazards. At its most inner core, the Plan recommends specific actions to combat hazard vulnerability and protect its residents from losses to those hazards that pose the greatest risk.

Table 13: Funding Sources for Property Mitigation Activities

Eligible Activities	Hazard Mitigation Grant	Pre-Disaster Mitigation	Flood Mitigation Assistance	Repetitive Flood Claim	Community Development Block Grant	Public Assistance Program	Severe Loss	Repetitive
Acquisition/Demolition <i>(for purposes of open space)</i>	✓	✓	✓	✓	✓			✓
Relocation	✓	✓	✓	✓	✓			✓
Elevation	✓	✓	✓	✓	✓			✓
Dry Flood-proofing <i>(historic residential structures)</i>	✓	✓	✓	✓	✓			✓
Public Facility Mitigation					✓	✓		✓
Mitigation Reconstruction					✓			✓
<i>A detailed description of the funding sources can be found in Section 9 of the Volusia County Local Mitigation Strategy.</i>								

A. Flooding Preventative Activities

Planning and regulatory capability is based on the implementation of plans, ordinances and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency management and mitigation planning, comprehensive land use planning, in addition to the enforcement of zoning and subdivision ordinances and building codes that regulate how land is developed and structures are built. Additionally, it protects environmental, historic and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate mitigation principles and best practices into the local decision making process in an effort to manage floodplain development. Table 2 refers to Volusia County and its jurisdictions plans, policies, codes and ordinances.

B. Property Preventative Activities

Property preventive activities are generally undertaken by property owners on a building-by-building or parcel basis. Some activities may include:

- **Buy-Out & Acquisition** - The act of acquiring or gaining possession to flood damaged properties and permanently preserving the land.
- **Relocation** – Moving a structure out of the floodplain to higher ground where it will not be exposed to flooding.
- **Elevation** – Raising a structure so that the lowest floor is above the flood level.
- **Flood Insurance** – A specific insurance coverage against property loss from flooding.
- **Wet Flood-Proofing** – Making uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding.
- **Dry Flood-Proofing** – Sealing the structure to prevent floodwaters from entering.

C. Natural Resource Protection Activities

These activities are customarily conducted to preserve or restore natural areas or the natural functions of floodplain and watershed areas. Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes and sand dunes. Parks, recreation or conservation agencies and organizations often implement these protective measures.

Examples of Natural Resource Protective Measures:

- Floodplain protection; watershed management
- Low impact development; bioswales; native landscaping
- Riparian buffers
- Erosion and sediment control
- Wetland preservation and restoration

D. Emergency Services Activities

Emergency services measures are taken prior to, during, and after an emergency to minimize vulnerability and impact. Volusia County Division of Emergency Management actively participates in training and exercise, as well as evacuation planning and emergency response. Currently Volusia County and 15 jurisdictions have an evacuation plan in place. In addition, Volusia County participated in the Statewide Regional Evacuation Study. Figure 15 depicts the regional evacuation routes and shelters within Volusia County. Other activities include sandbagging for flood protection and emergency response training and exercises. Volusia County and its municipalities continue to be proactive in emergency response training and exercises. Some examples include participation in the Statewide Tsunami Exercise and the Statewide Tornado Drill.

E. Structural Projects

Structural projects keep floodwaters away from an area with a levee, reservoir, or other flood control measure. Structural projects are usually designed by engineers and managed or maintained by public works staff. Examples of structural projects include:

- Reservoirs
- Channel modifications
- Levees/floodwalls/seawalls
- Beach nourishment
- Diversions, Flood Dams
- Storm sewers; bioswales on roadways; “Green Streets”

F. Public Education and Awareness Activities

Public Education and Awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include outreach projects. Through an agreement with

Volusia County, WNDB 1150AM/WHOG 95.7FM radio and WDSC TV-15 are Volusia County's official emergency management information stations. WNDB has a broadcast outlet at the CEOC. WDSC enhances the County's ability to provide critical public safety information with a direct, live television connection. Volusia County's website hosts a flood map viewer which is an on-line mapping program that has searchable flood maps. The flood map viewer allows an individual to type in an address or property identification number to see the parcel on an interactive map in relation to the high-risk flood areas. Volusia County and its jurisdictions also provide real estate agents with floodplain disclosures. Information regarding floods can also be found at the County Libraries. Volusia County actively provides updates on events and public outreach through Facebook and Twitter.

It was identified through the public survey process that many residents are unsatisfied with educational and outreach efforts provided by the jurisdictions. It is recommended that throughout the year and during the yearly plan update, at least one public meeting be held to provide information to the residents concerning mitigation and associated funding options. In addition, social media, mailings, workshops, and informational booths at events are also suggested as well as public service announcements and information in the local newspaper. Providing strategies, funding resources and other education material both electronically on all the jurisdictional websites and in print in libraries and City Halls would be beneficial.

G. Action Plan

The Volusia County Multi-Jurisdictional Local Mitigation Strategy features a mitigation action plan that is maintained through the LMS Working Group as well as the FMP working group. The Mitigation Strategy is the selection and prioritization of specific mitigation actions, referred to as Hazard Mitigation Initiatives, for Volusia County and participating jurisdictions. The Mitigation Action Plan (MAP) represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process. This detailed Action Plan can be found in Section 8 of the Volusia County Multi-Jurisdictional Local Mitigation Strategy. Flood-specific projects are located in Appendix G of this report.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for Volusia County and its participating jurisdictions and partners to carry out with accompanying information such as those departments or individuals assigned responsibility for their implementation, potential funding sources and an estimated target date for completion, serving as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to

quickly review the recommendations and proposed actions of the Hazard Mitigation Plan. The Mitigation Action Plan can be found in Appendix G.

The LMS working group has reviewed and prioritized the initiatives and projects found in the Action Plan. The prioritization was based on the following factors: Population Benefited, Health and Safety Considerations, Environmental Impact, Consistency with other plans and programs, Reduces Risk of Future Property Damage, Supports Essential or Critical Services, Probability of Receiving Funding and ease of Implementation, Community Rating System, Repetitive Loss Mitigation, and Benefit Cost Ratio. Please refer to the table on the next page which justifies the scoring the system. It is important to note that since this plan is to be incorporated into the Volusia County Local Mitigation Strategy (LMS), it will fall under all of the implementation, evaluation and revision criteria and schedule as outlined specifically in the LMS.

Post-Disaster Redevelopment Strategies and Procedures

The County has completed and incorporated a Post Disaster Redevelopment Plan and Debris Management Plan into its ongoing planning process. In addition, a Continuity of Operations Plan has been developed to ensure that all County Emergency Support Functions (ESF's) work in unison following a hazard event. A link to these three plans is included below:

- [Volusia County Continuity of Operations Plan](#)
- [Volusia County Debris Management Plan](#)
- [Volusia County Post-Disaster Redevelopment Plan](#)

Natural Hazard Mitigation Strategies and Procedures

The County deals with natural hazard mitigation and procedures through this plan and the Local Mitigation Strategy. The Local Mitigation Strategy Priority Projects listing includes projects geared to reduce the impacts of flooding, storm surge, wind, and other natural hazards. In addition, the Priority Projects dealing with flooding have been added to Appendix G (the Action Plan) of this report. The 2020 Floodplain Management Plan has been affirmed with Resolutions of Adoption (Appendix I) for incorporation into the Volusia County Floodplain Management Plan. A link to the plan is included below:

- [Volusia County Local Mitigation Strategy](#) (scroll down to "Local Mitigation Strategy 2015 – FEMA Approved")

Table 14: Prioritization and Scoring Worksheet

Prioritization Criteria	Scoring			
<u>Population Benefited</u>	4 Points: Project will benefit a multi-jurisdictional area	3 Points: Project will benefit a jurisdictional area	2 Points: Project will benefit less than 100% of a jurisdiction.	
<u>Health and Safety Considerations</u>	4 Points: Project would benefit 75% or more of the population.	3 Points: Project would benefit 50 -74 % of the population.	2 Points: Project would benefit 25-49% of the population.	1 Point: Project would benefit less than 25% of the population.
<u>Environmental Impact</u>	1 Point: Project improves the environment.	0 Point: Risk to the environment is undetermined.	(-1) Point: Project poses a risk to the environment.	
<u>Consistency with other plans and programs</u>	4 Points: Project is incorporated into the LMS CEMP and Comp Plan and supports the NFIP.	3 Points: Project is incorporated into at least two of these plans.	2 Points: Project is incorporated into at least one of these plans.	1 Point: Project is consistent with other local standards, aside from LMS, CEMP, and Comp Plan.
<u>Reduces Risk of Future Property Damage</u>	4 Points: Mitigates a hazard of high frequency or risk.	3 Points: Mitigates a hazard of moderate frequency or risk.	2 Points: Mitigates a hazard of low frequency or risk.	1 Point: Mitigates a hazard of very low frequency or risk.
<u>Supports Essential or Critical Services</u>	5 Points: Project will ensure continuity of operations for essential infrastructure or services.	3 Points: Project will support infrastructure or services with loss/damage history	1 Point: Project will support infrastructure or services without loss/damage history.	0 Points: Projects operation will have no impact on community infrastructure or services if disrupted.
<u>Probability of Receiving Funding for Implementation</u>	4 Points: Limited funding potential exists.	3 Points: Potential funding sources are other state or federal grants or similar funding sources.	2 Points: Potential funding is readily available through emergency preparedness or mitigation funding sources.	0 Points: Potential funding is readily available through local funding sources.
<u>Feasibility of Implementation</u>	4 Points: Project would be relatively easy to implement in one year.	3 Points: Project would be easy to implement in three years.	2 points: Project would be easy to implement in five years.	0 Points: Project would be difficult to implement.
<u>Community Rating System (CRS)</u> -public information, mapping - damage reduction -flood preparedness	4 Points: Project supports CRS elements	3 Points: Project supports three CRS elements.	2 Points: Project supports two CRS elements.	1 Point: Project supports one CRS element.
<u>Repetitive Loss (RL) Mitigation</u>	4 Points: Project protects 50% or more of the RL structures.	2 Points: Project protects less than 50% of the RL structures.	4 Points: Project does not protect a RL structures.	
<u>Benefit Cost Ratio (BCR)</u>	5 Points: Project has a BCR of "1" or higher, using FEMA approved software.	3 Points: Project has a BCR of less than "1" using FEMA approved software.	0 Points: the BCR cannot be determined.	

IX. PLAN MAINTENANCE

A. Adopt the Plan

Each jurisdiction participating in the CRS program is required to adopt the Floodplain Management Plan formally through individual jurisdictional boards. Appendix I provides copies of all adopted resolutions. Please note, this section is a working section, as the adoption process may vary amongst the jurisdictions. As each jurisdiction provides a copy of the adopted resolution, it will be added to the appendix of the plan. The Volusia County Emergency Management Division is responsible for the master copy of the Floodplain Management Plan.

B. Implement, Evaluate, and Revise

As the responsible party for the FMP, the Volusia County Emergency Management Division will oversee the implementation, evaluation, and revision of the plan on a County-wide basis. Jurisdictional implementation and revision of Appendix A is the responsibility of each individual jurisdiction.

Procedures for monitoring the implementation, progression and revisions of the plan are completed through the Local Mitigation Strategy Steering Committee, also referred to as “Volusia Prepares”. This committee meets on a quarterly basis to review aspects of the LMS, including the FMP, and other topics such as CRS upkeep and requirements. The working group is made up of Volusia County Emergency Management staff and one representative from each participating Town or City. The working group implements the plan through Resolutions of Support and Resolutions of Adoption, evaluates the plan on a case-by-case basis, and revises the plan through the development of the “Action Plan” of priority projects, which are updated during Steering Committee Meetings as needed.

The LMS Steering Committee and the FMP Planning Committee are generally comprised of the same jurisdictional staff members. For the purpose of updating and maintaining the FMP, the FMP Planning Committee composition will continue to encompass the jurisdictional staff responsible for the implementation of the FMP and related policies and projects as it had been during the initial planning process. Pursuant to CRS Activity #510, an annual progress report is submitted.

This Floodplain Management Plan is considered an appendix to the Volusia County LMS. To that end, the maintenance of this document will occur in conjunction with the yearly LMS updates. During the third quarter of the calendar year

(July/August/September), the County and the jurisdictions will provide any updates, including data and projects, to the County for review by the LMS Steering Committee/FMP Planning Committee. The steering committee will review any updates and the County will be responsible for implementing the updates in the master plan. In addition, the evaluation report will be prepared by the FMP Planning Committee and address updates per jurisdiction. Each community will submit its copy of the annual evaluation report with its recertification annually. The Volusia County Emergency Management Division will be responsible for the five year update process. During this update period, the public will have the opportunity to participate in the updating process. It is recommended that at least one public meeting is held during this period to provide input. In addition, it is recommended that notification be submitted via databases, utility mailings, websites, and social media, concerning the update process, public meetings, and other avenues of input. The current plan as well as the proposed changes should be made available on each jurisdictional website as well as a hard copy be provided at the City Halls and libraries. Press releases, radio and TV announcements may also be utilized to inform the public.

Once per year, elected officials will be provided a copy of the most current Floodplain Management Plan in conjunction with the LMS. At that time, hard copies of the plan will be replaced at the designated location in participating jurisdictions. The table below indicates where the jurisdictions will keep a hard copy of the plan for public use

Table 15: Plan Storage Locations

City	Hard Copy Location
Main Copy	City Island Library - 105 East Magnolia Avenue, Daytona Beach FL 32114
Daytona Beach	125 Basin Street (Suite 100), Daytona Beach FL 32114
Daytona Beach Shores	2990 S. Atlantic Avenue, Daytona Beach Shores FL 32118
DeBary	<i>Not Specified</i>
DeLand	<i>Not Specified</i>
Deltona	<i>Not Specified</i>
Edgewater	104 N. Riverside Drive, Edgewater FL 32132
Holly Hill	<i>Not Specified</i>
Lake Helen	<i>Not Specified</i>
New Smyrna Beach	<i>Not Specified</i>
Oak Hill	<i>Not Specified</i>
Orange City	<i>Not Specified</i>
Ormond Beach	22 South Beach Street (Room 104), Ormond Beach FL 32174
Pierson	<i>Not Specified</i>
Ponce Inlet	<i>Not Specified</i>
Port Orange	<i>Not Specified</i>
South Daytona	1672 S. Ridgewood Avenue, South Daytona FL 32119



Appendix A Jurisdictional Profiles





Daytona Beach

Floodplain Management Goals and Objectives

Goal: Promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas

- Objective: Maintain the City's Community Rating System Classification;
- Objective: Provide flood protection information to residents;
- Objective: Coordinate and implement small and/or large scale projects to help alleviate drainage and flood concerns;
- Objective: To protect human life, health and to eliminate or minimize property damage;
- Objective: Require the use of appropriate construction practices to prevent or minimize future flood damage;
- Objective: Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials and other development activities which may increase flood damage or erosion potential;
- Objective: Manage the alteration of flood hazard areas, watercourses and shorelines to minimize the impact of development on the natural and beneficial functions of floodplains;
- Objective: To minimize the need for rescue and relief efforts associated with flooding that are generally undertaken at the expense of the general public;
- Objective: To minimize prolonged business interruptions;
- Objective: To minimize damage to public facilities and utilities, such as water mains, gas mains, electric lines, telephone lines and sanitary sewer lines, streets, bridges and stormwater culverts located in floodplains;
- Objective: To maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas;
- Objective: To ensure that potential homebuyers are notified when the property is in a flood hazard area;
- Objective: To help maintain a stable tax base by providing for the sound use and development of flood prone areas in order to minimize flood blight areas.

Goal: To create programs to manage the surface water runoff

- Objective: Develop/maintain storm water management plan;
- Objective: Develop alternative water supply on western city limits.

Daytona Beach

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Worck Haven Assisted Living	Assisted Living	A
Golden Abbey Assisted Living	Assisted Living	AE
Forest Lake Manor	Assisted Living	AE
Herald's Retirement Home	Assisted Living	AE
Compassion in Healthcare	Assisted Living	AE
Trinity Care Center	Assisted Living	AE
Manor on Green	Assisted Living	A
Good Samaritan Society	Assisted Living	A
Cingular Wireless – Int'l Speedway	HazMat Facility	A
Florida Rock Industries	HazMat Facility	A
Communication Facility DYBHFLGY	HazMat Facility	A
Communication Facility DYBHFLMN	HazMat Facility	A
Century Link QCC Daytona	HazMat Facility	A
MCI Facility FLDAYFDL	HazMat Facility	A
Sprint Cell Site FL3134	HazMat Facility	A
Sprint Pop Site	HazMat Facility	A
Conrad Yelvington Distributors	HazMat Facility	A
FAA DAB ATCT	HazMat Facility	AE
Decorative Electro Coatings	HazMat Facility	A
Wastewater Treatment Plant	HazMat Facility	A
Daytona Beach Fire Station 1	Fire Station	A
Daytona Beach Fire Station 6	Fire Station	AE
Daytona Beach Public Works	Government	AE
Fifth District Court of Appeal	Government	AE
Sunrise Surgical Center	Medical	A
Bethune Cookman College	School	A
Champion Elementary School	School	A
Father Lopez High School	School	A
Turie T Small Elementary School	School	A
Word and Praise Chr. Learning Ctr.	School	A
Daytona Electric Substation	Utility	A
Halifax Wrecking Company	Waste Facility	A
Florida Rock Daytona	Waste Facility	A

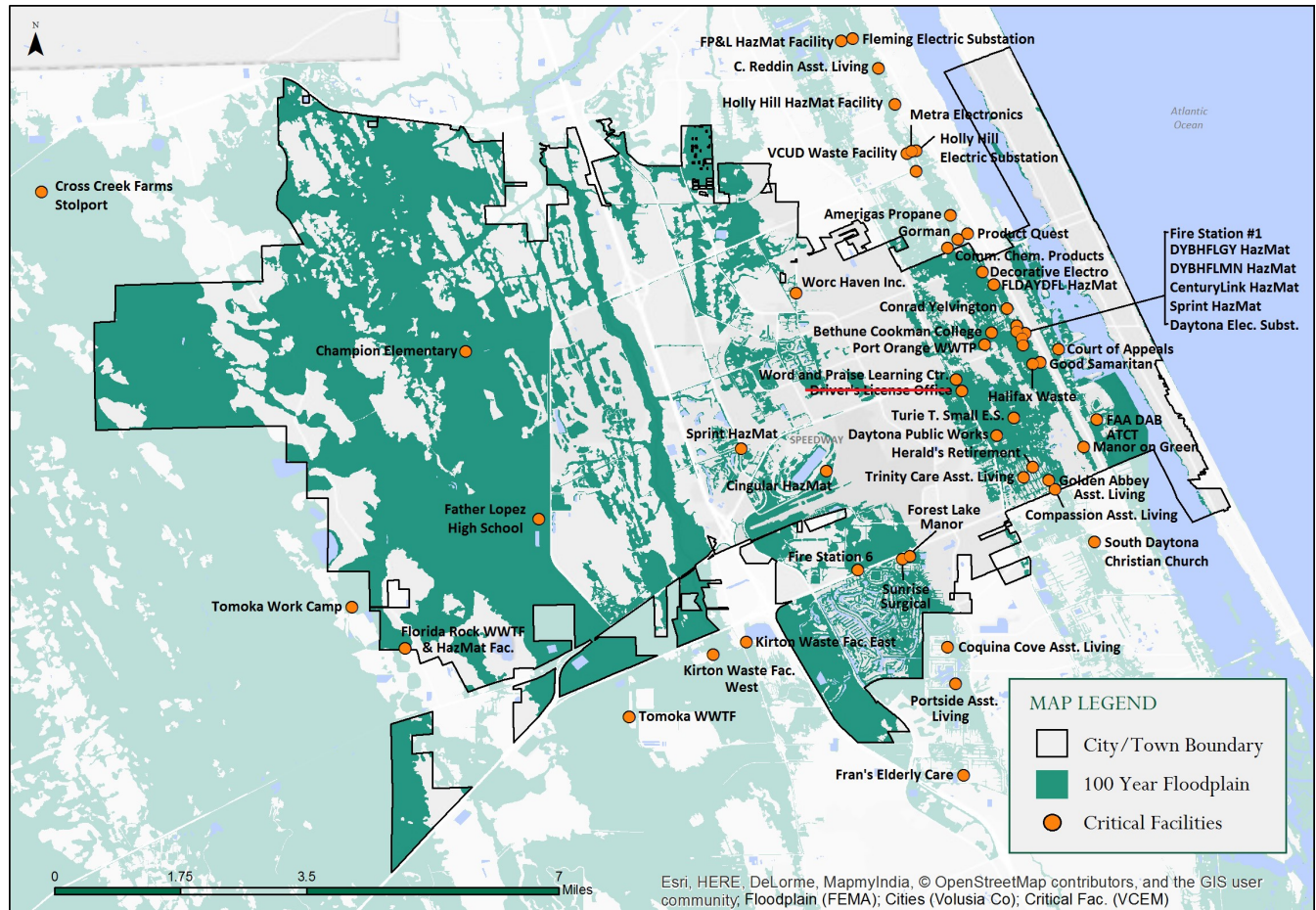
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	49.6%
Buildings in the Floodplain	8,770

Exposed Acreage: Residential Future Land Use	7,802
Exposed Acreage: Commercial Future Land Use	1,188
Exposed Acreage: Mixed Use Future Land Use	882
Exposed Acreage: Industrial Future Land Use	968
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	309

Total Exposure: Land Value	\$1,031,935,148
Total Exposure: Building Value	\$2,492,556,826
Total Exposure: Assessed Value	\$3,626,954,919
Total Exposure: Taxable Value	\$2,317,906,555

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Daytona Beach Shores

Floodplain Management Goals and Objectives

Goal: Prevent new development in the floodplain from increasing runoff and resulting in increases in flood volumes in the floodplain.

- Objective 1.1 Enforce building requirements from the National Flood Insurance Program and not allow variances that are feasibly avoidable.
- Objective 1.2 Prevent new development in the floodplain.
- Objective 1.3 Minimize flood hazards and protect water quality by employing approaches that balance environmental, economic, and engineering considerations.
- Objective 1.4 Protect environmentally sensitive lands to maximize their inherent mitigation attributes and reduce known flood hazards where appropriate and financially feasible.
- Objective 1.5 Reduce flood exposure and maximize flood protection efforts.

Goal: Develop and maintain a proactive public awareness and outreach that informs and notifies property owners that they are located in a flood zone and provides assistance and information regarding flood zones, protection of property, local drainage and sewer back-up problems.

- Objective 2.1 Create easily accessible information to educate residents about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains.
- Objective 2.2 Encourage land and water uses compatible with the protection of environmentally sensitive lands and coastal resources.
- Objective 2.3 Review the adequacy and completeness of emergency procedures that address catastrophic flood events.
- Objective 2.4 Minimize impacts from flooding in FEMA designated special flood hazard areas (i.e. flood zones starting with the letters "V" or "A") where financially feasible.
- Objective 2.5 Build a constituency that desires to see the plan's recommendations implemented.

Goal: Continue with the Hazard Mitigation Grant Program to identify and obtain funding for both pre-and-post disaster residential mitigation projects regarding flooding.

- Objective 3.1 Identify various flood mitigation grants that may assist residences located in the floodplain.
- Objective: Utilize "Volusia Prepares" Local Mitigation Strategy to guide and assist in establishing priorities for hazard mitigation projects.

Goal: Reduce the number of repetitive loss properties within Volusia County.

Goal: Review the locations and effects on areas that experience flooding and determine what steps, if any, the City can take to alleviate future impacts.

- Objective 5.1 Maintain a database of flood problems and hazards, mitigation and repetitive loss claim history.
- Objective 5.2 Build public and political support for projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains.
- Objective 5.3 Prioritize capital projects that will mitigate flood impacts in areas of the City that have experienced significant flooding problems.

Daytona Beach Shores

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		

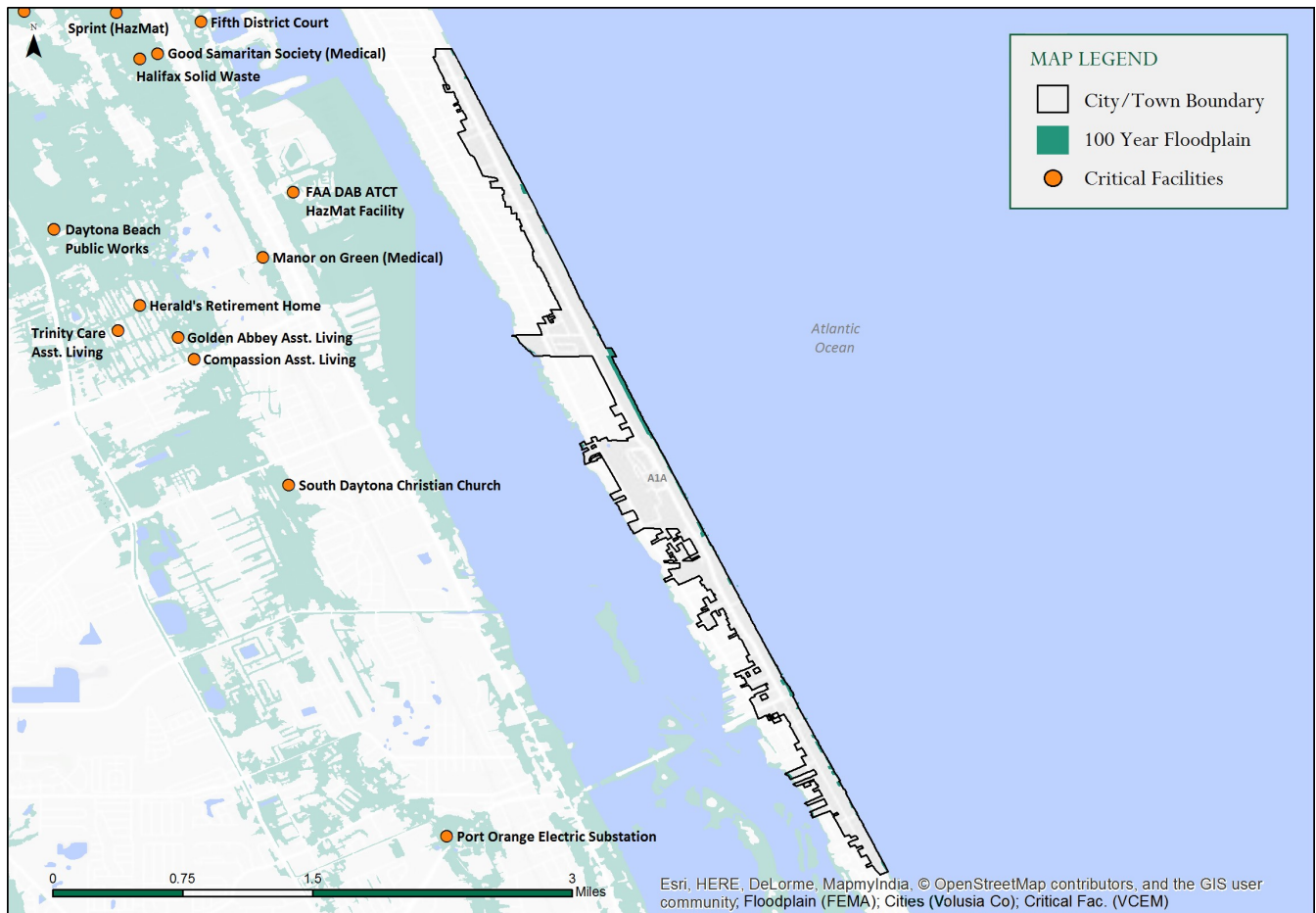
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	74.9%
Buildings in the Floodplain	132

Exposed Acreage: Residential Future Land Use	27
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	-
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	0.1

Total Exposure: Land Value	\$408,090,848
Total Exposure: Building Value	\$995,734,555
Total Exposure: Assessed Value	\$1,442,221,431
Total Exposure: Taxable Value	\$1,332,476,443

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



DeBary



Floodplain Management Goals and Objectives

Goal: Manage storm water runoff and the preservation of water resources.

- Objective: Alleviate downstream flood hazards
- Objective: Prevent significant loss of life and property due to runoff from any foreseeable rainfall event
- Objective: Reduce the capital expenditure associated with flood-proofing and the installation and maintenance of storm drainage systems.

Goal: Promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas.

- Objective: Protect human life, health and to eliminate or minimize property damage
- Objective: Minimize expenditure of public money for costly flood control projects
- Objective: Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public
- Objective: Maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize flood blight areas.
- Objective: Ensure that potential homebuyers are notified that property is in a flood hazard area.

DeBary

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		

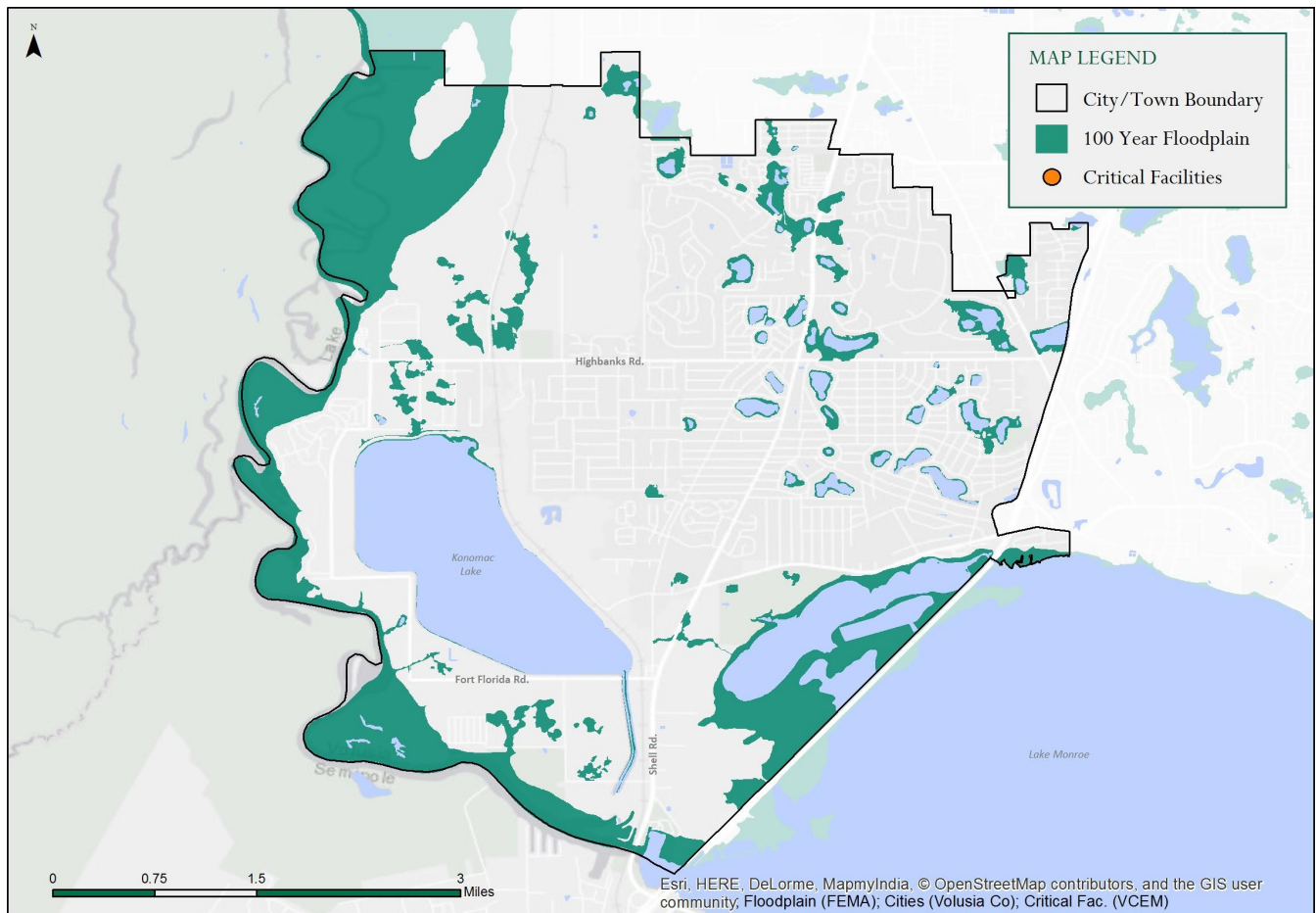
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	14.2%
Buildings in the Floodplain	1,095

Exposed Acreage: Residential Future Land Use	269
Exposed Acreage: Commercial Future Land Use	61
Exposed Acreage: Mixed Use Future Land Use	73
Exposed Acreage: Industrial Future Land Use	147
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	65

Total Exposure: Land Value	\$93,671,202
Total Exposure: Building Value	\$162,003,662
Total Exposure: Assessed Value	\$263,763,736
Total Exposure: Taxable Value	\$191,512,792

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



DeLand



Floodplain Management Goals and Objectives

Goal 1: Minimize public and private losses due to flood conditions in specific areas.

- Objective 1.1: Prioritize and implement capital projects to alleviate known drainage and flooding problems.
- Objective 1.2: Maintain existing storm water facilities to function near optimal capacity.
- Objective 1.3: Sweep streets to maintain positive visual appearance and to prevent build-up of debris in storm systems within City right of way.
- Objective 1.4: Maintain storm water pump stations and standby generators in good condition at all times

Goal 2: Provide adequate funding for construction of storm water system improvements and operation and maintenance of existing systems

- Objective 2.1: Obtain revenue from all storm water system users by collection of utility fees accessed in proportion to benefit derived.
- Objective 2.2: Analyze and adjust storm water utility rates as necessary to fund priority capital projects and operating expenses.

Goal 3: Regulate new development and redevelopment to reduce or eliminate increases in flood volumes and additional flooding conditions.

- Objective 3.1: Enforce building requirements from the National Flood Insurance Program
- Objective 3.2: Prevent new development in the flood plain unless mitigated.
- Objective 3.3: Consider downstream effects of new development and require mitigation as appropriate.
- Objective 3.4: Reduce quantity and improve quality of runoff from developed properties when redeveloped.

DeLand

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
DeLand Water Supply Plant	Utility	A

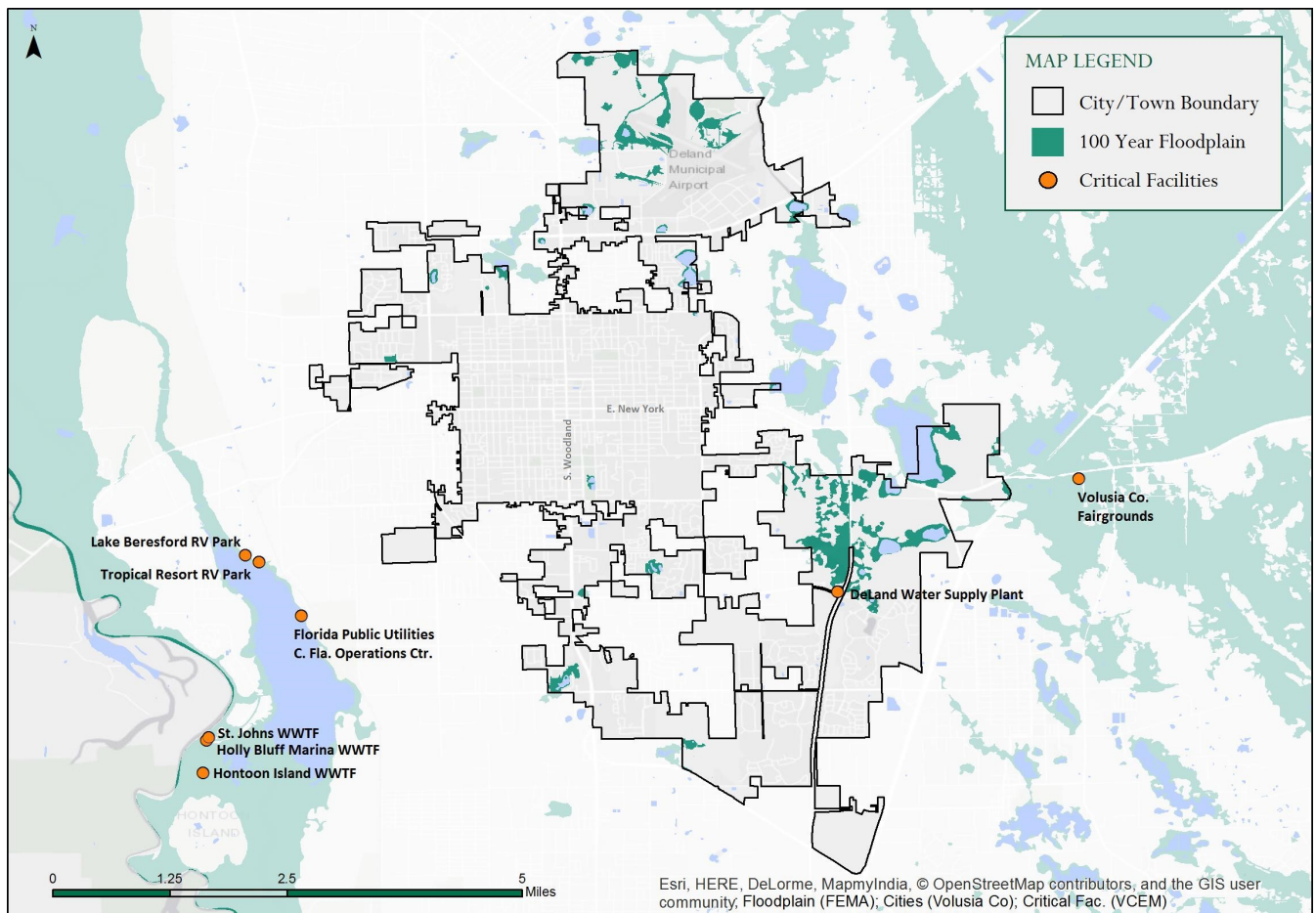
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	1.6%
Buildings in the Floodplain	121

Exposed Acreage: Residential Future Land Use	302
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	111
Exposed Acreage: Industrial Future Land Use	212
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	1

Total Exposure: Land Value	\$36,181,192
Total Exposure: Building Value	\$71,983,599
Total Exposure: Assessed Value	\$112,726,316
Total Exposure: Taxable Value	\$50,845,772

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Deltona

Floodplain Management Goals and Objectives

Goal: Protect and appropriately utilize the physical and ecological functions of natural drainage ways and related drainage patterns.

- Objective: The City shall discourage development within any known flood plains as identified by the best available data, such as FEMA flood maps.
- Objective: Development and structures shall be discouraged within the 100-year flood plain; however, if located therein they shall be constructed in a manner that results in a no loss in of existing 100 year floodplain storage and function.
- Objective: If structures are allowed in the 100-year flood plain, development within areas prone to 100 year flooding shall compensate for the full amount of flood storage displacement within the 100 year floodplain and shall not increase expected flood levels for adjacent properties or reduce receiving surface water quality below established levels.
- Objective: The functions of flood plains and other flood prone areas shall be protected by directing development away from such areas. If activities do occur within floodplain or flood prone areas such impacts shall be minimized. In addition, if development does occur within floodplain/prone areas then techniques such as compensating storage and the elevation/design of improvements shall be required to ensure that floodplain functions are protected.

Goal: The City of Deltona shall continue to implement the comprehensive surface and groundwater watershed management plan.

- Objective: On-site sewage disposal systems and associated drain fields shall be discouraged within the flood plain of surface water bodies as provided for in land development regulations, to the extent that such systems are designed and located so as to not contribute to the degradation of ambient water quality as consistent with applicable State regulations.
- Objective: Undisturbed segments of flood plains shall be protected through public acquisition, land use controls, conservation easements, or other methods as appropriate.
- Objective: Proposed structures located within the flood plain of surface water bodies and within flood prone areas, shall be required to utilize building methods as provided in land development regulations, to the extent that fill material required for construction or other impervious surfaces will not reduce the ability of the floodplains to store and convey floodwaters, or degrade the natural physical and biological functions of protected habitat without approved mitigation. Impacts of fill in the floodplains and flood prone areas shall be considered both sites specifically and cumulatively. 9J-5.013(2)(c)(9)
- Objective: Dwelling unit densities shall not be increased within the flood plains of surface water bodies and in other flood prone areas as provided for in land development regulations, and per Florida Statute in that allowable densities do not create potential flood hazards, or degrade the natural functions of the flood plain. Dwelling unit density determinations in the floodplain shall consider both site specific and cumulative impacts.

Goal: Protect and appropriately utilize the physical and ecological functions of natural drainage ways and related drainage patterns.

Deltona

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Deltona Water Plant	Utility	AE
TAP Electric Substation	Utility	AE

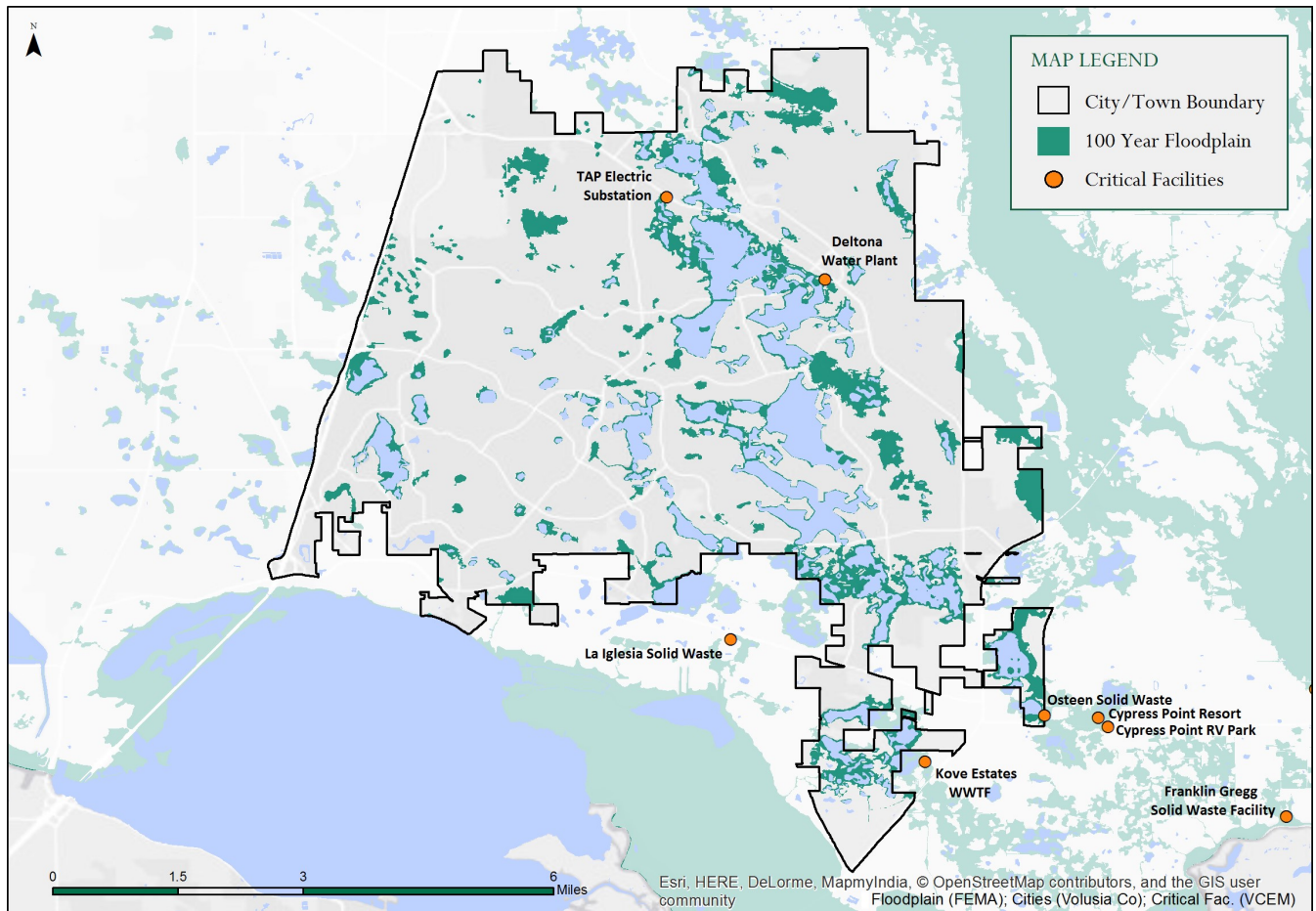
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	14.5%
Buildings in the Floodplain	4,524

Exposed Acreage: Residential Future Land Use	3,547
Exposed Acreage: Commercial Future Land Use	16
Exposed Acreage: Mixed Use Future Land Use	1,982
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	57

Total Exposure: Land Value	\$122,580,488
Total Exposure: Building Value	\$563,266,460
Total Exposure: Assessed Value	\$711,052,496
Total Exposure: Taxable Value	\$398,048,314

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Edgewater



Floodplain Management Goals and Objectives

Goal: Continue to maintain a floodplain management ordinance, which includes the development standards required for participation in the National Flood Insurance Program.

- Objective: New construction, or substantial improvement, of any residential structure shall have the lowest floor, including basement, elevated no less than one foot (1') above the base flood elevation or crown of the paved road whichever is greater, or 16 inches (16") above an unpaved road.
- Objective: Plans and designs for subdivisions shall minimize potential flood damage by locating recreation and conservation uses, if included in the plans, to areas within the Flood Zone, reserving as much land as possible outside the flood zone for other land uses. Flood zones shall be identified on all final development plans submitted to the City.

Goal: Strongly discourage development within flood prone areas is strongly discouraged and mitigate any adverse impacts to the surrounding area that may be related to drainage, public health or public safety.

- Objective: Encroachments within the published flood way will not be approved under any circumstances.
- Objective: Compensatory storage for 100-year flood plain encroachments shall be provided in accordance with the City requirements.
- Objective: Projects located near the coast should evaluate any flooding effects associated with both storm surge (FEMA Zones V and VE) and the freshwater flood (FEMA Zones A, AE, AH and AO).

Goal: Protect the natural function and values of the 100-year floodplain.

- Objective: 100-year floodplain shall be given high priority in the selection of conservation areas within the City and for public acquisition of lands for conservation and recreational purposes.
- Objective: Development within the 100 Year Floodplain shall provide necessary mitigation to maintain the natural storm water flow regime.
- Objective: All new construction and substantial improvements of existing construction shall be constructed with materials and utility equipment resistant to flood damage, and using methods and practices that will minimize flood damage and prevent the pollution of surface waters during a 100 year flood event.

Goal: Limit development in the Coastal High Hazard Area and direct population concentrations away from this area.

- Objective: No new public facilities shall be located in the Coastal High Hazard Areas other than those necessary to support the levels of service identified in the Capital Improvement Element and for overriding health and safety reasons.
- Objective: By December 2014, the City shall identify areas in the Coastal High Hazard Area needing redevelopment, including eliminating unsafe conditions and inappropriate uses as opportunities arise.
- Objective: No future land use amendments shall be approved within the Coastal High Hazard Area which will increase the previously permitted density.

Edgewater

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		

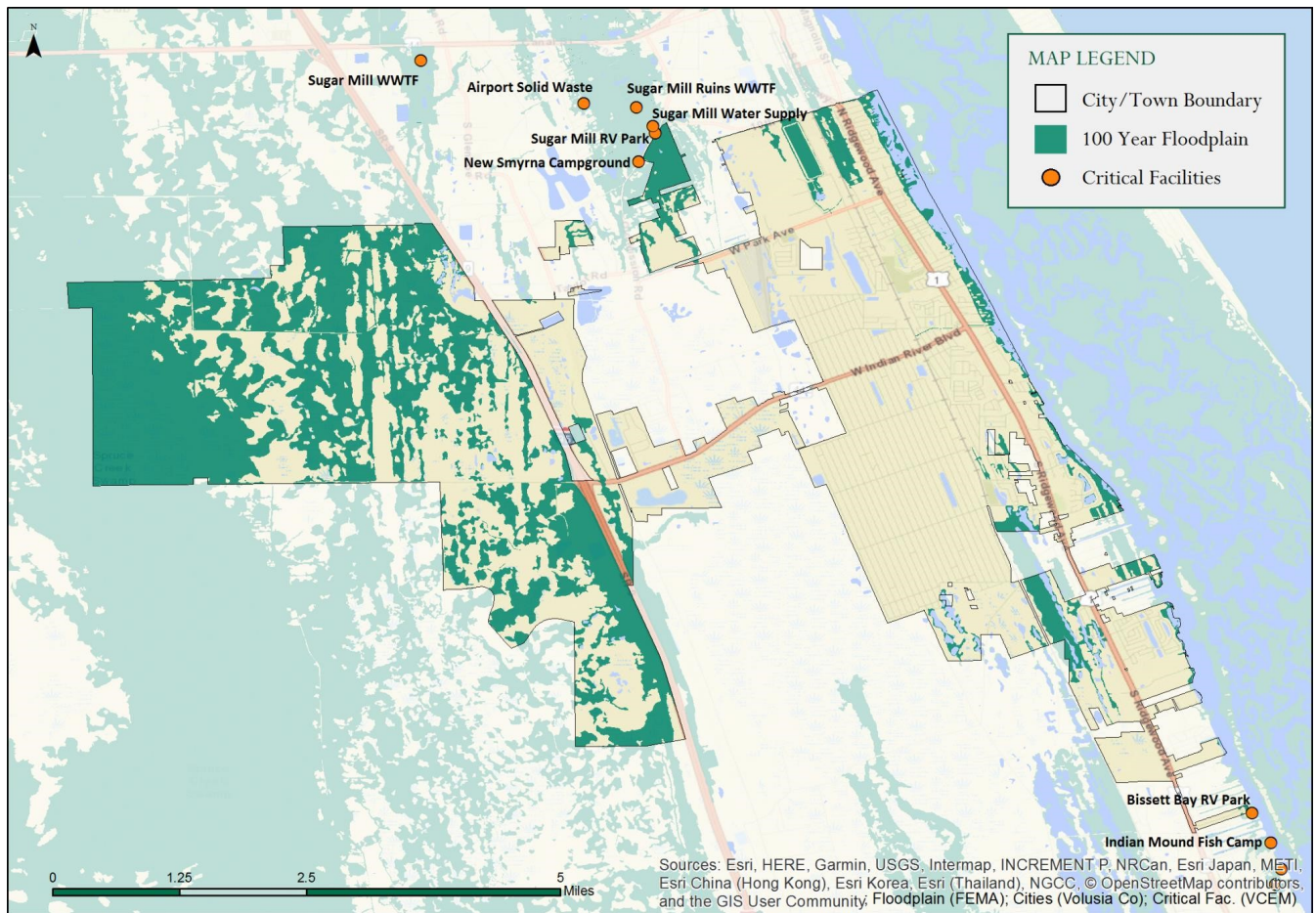
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	8.0%
Buildings in the Floodplain	644

Exposed Acreage: Residential Future Land Use	446
Exposed Acreage: Commercial Future Land Use	16
Exposed Acreage: Mixed Use Future Land Use	1,982
Exposed Acreage: Industrial Future Land Use	86
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	57

Total Exposure: Land Value	\$131,100,527
Total Exposure: Building Value	\$108,511,438
Total Exposure: Assessed Value	\$244,402,829
Total Exposure: Taxable Value	\$161,654,623

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Holly Hill

Floodplain Management Goals and Objectives

Goal: Safeguard the public health, safety and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas.

- Objective: Minimize unnecessary disruption of commerce, access and public service during times of flooding
- Objective: require the use of appropriate construction practices in order to prevent or minimize future flood damage
- Objective: Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials and other development which may increase flood damage or erosion potential
- Objective: Manage the alteration of flood hazard areas, watercourses and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain
- Objective: Minimize damage to public and private facilities and utilities
- Objective: Help maintain a stable tax base by providing for the sound use and development of flood hazard areas
- Objective: Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events
- Objective: Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22

Holly Hill

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Amerigas Propane	HazMat Facility	AE
Level 3 Communication Tower	HazMat Facility	AE
Gorman Holly Hill	HazMat Facility	AE
Metra Electronics	HazMat Facility	AE
Commercial Chemical Products	HazMat Facility	AE
Product Quest MFG	HazMat Facility	A
Holly Hill Electric Substation	Utility	AE
Holly Hill Wastewater Facility	Waste Facility	AE
VCUD Wastewater Facility	Waste Facility	AE

Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	51.0%
Buildings in the Floodplain	2,102

Exposed Acreage: Residential Future Land Use	450
Exposed Acreage: Commercial Future Land Use	24
Exposed Acreage: Mixed Use Future Land Use	0.3
Exposed Acreage: Industrial Future Land Use	142
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	10

Total Exposure: Land Value	\$112,732,648
Total Exposure: Building Value	\$315,339,218
Total Exposure: Assessed Value	\$433,456,264
Total Exposure: Taxable Value	\$342,878,826

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Lake Helen

Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in the report.



Lake Helen

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		

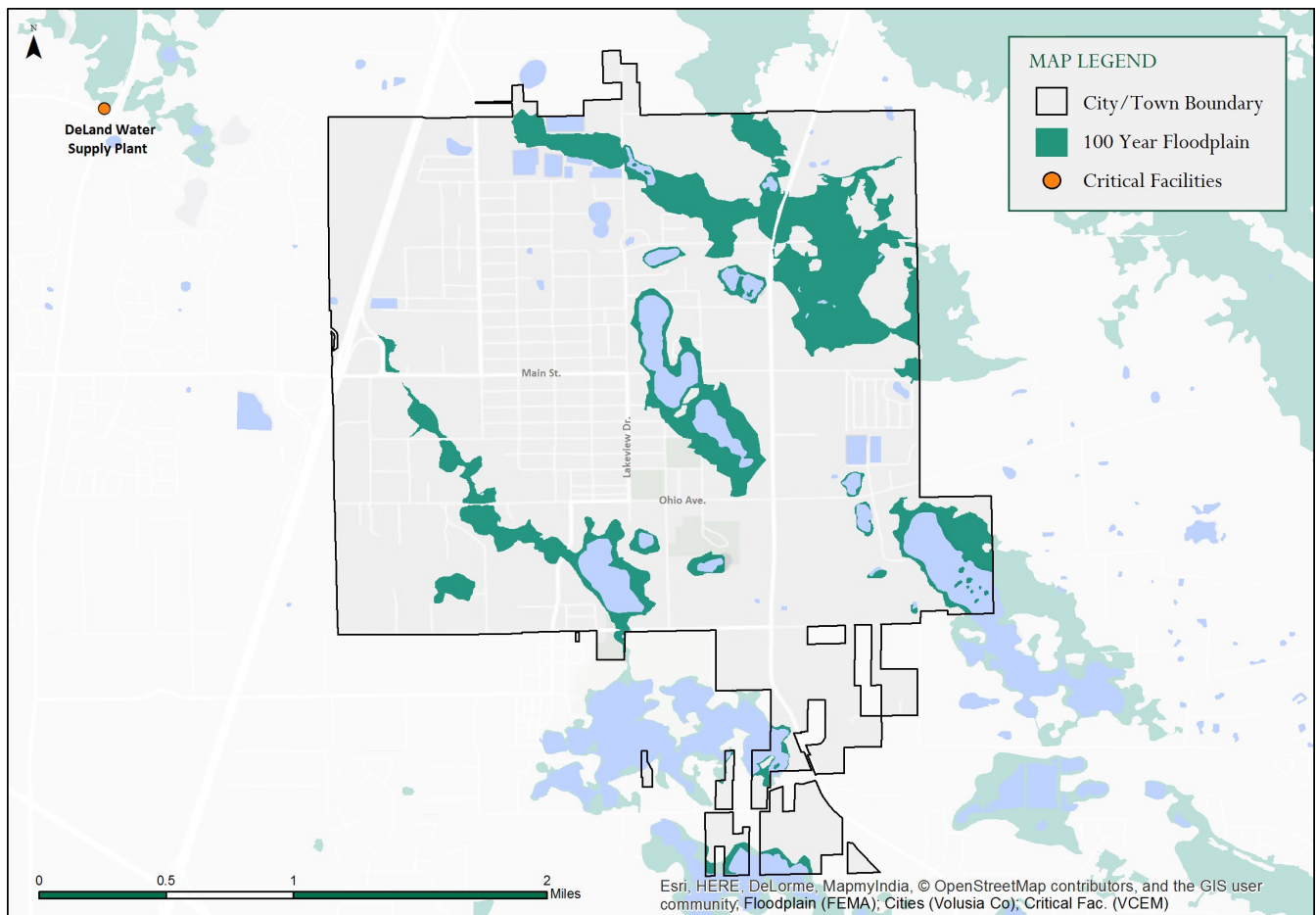
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	16.9%
Buildings in the Floodplain	140

Exposed Acreage: Residential Future Land Use	200
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	10
Exposed Acreage: Industrial Future Land Use	2
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	5

Total Exposure: Land Value	\$14,937,971
Total Exposure: Building Value	\$21,641,857
Total Exposure: Assessed Value	\$38,079,497
Total Exposure: Taxable Value	\$23,442,299

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



New Smyrna Beach



Floodplain Management Goals and Objectives

Goal: Promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas.

- Objective: Maintain the City's Community Rating System Classification;
- Objective: Provide flood protection information to residents;
- Objective: Coordinate and implement small and/or large scale projects to help alleviate drainage and flood concerns;
- Objective: To protect human life, health and to eliminate or minimize property damage;
- Objective: require the use of appropriate construction practices in order to prevent or minimize future flood damage;
- Objective: Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials and other development which may increase flood damage or erosion potential;
- Objective: Manage the alteration of flood hazard areas, watercourses and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain;
- Objective: To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Objective: To minimize prolonged business interruptions;
- Objective: To minimize damage to public facilities and utilities, such as water and gas mains, electric, telephone and sewer lines, streets, bridges and culverts located in floodplains;
- Objective: To maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas;
- Objective: To endeavor that potential homebuyers are notified that property is in a flood hazard area;
- Objective: To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas.

Goal: Create programs to manage the surface water runoff

- Objective: Develop/maintain storm water management plan
- Objective: Develop alternative water supply on western city limits

New Smyrna Beach

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Tiffany on River	Assisted Living	AE
Smyrna West	Assisted Living	AE
Fairgreen Assisted Living	Assisted Living	AE
Little River Manor	Assisted Living	AE
Airport Substation	HazMat Facility	AE
Momentive Performance Materials	HazMat Facility	AE
New Smyrna Beach Solid Waste	Waste Facility	AE

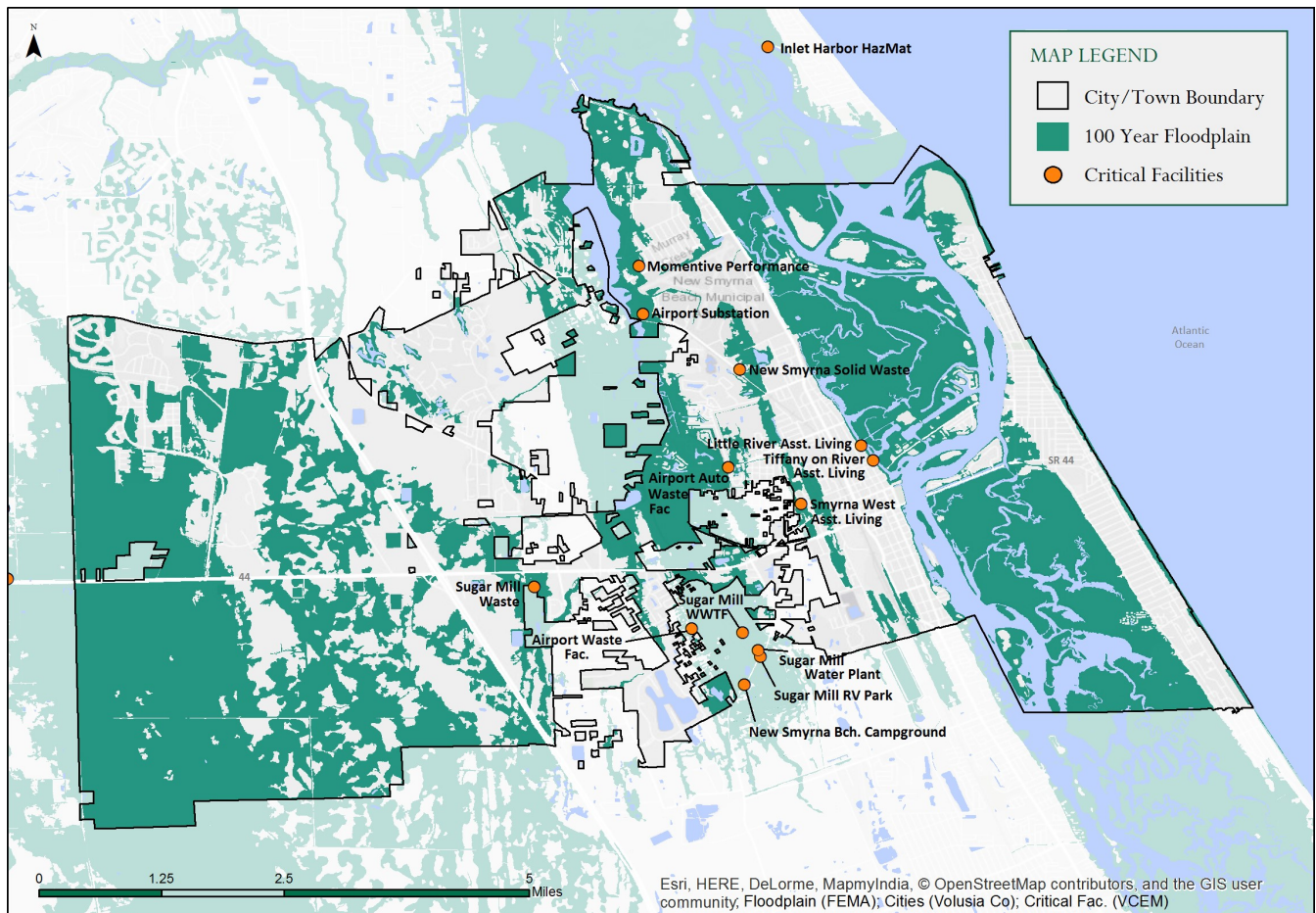
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	41.5%
Buildings in the Floodplain	3,618

Exposed Acreage: Residential Future Land Use	1,718
Exposed Acreage: Commercial Future Land Use	220
Exposed Acreage: Mixed Use Future Land Use	222
Exposed Acreage: Industrial Future Land Use	180
Exposed Acreage: PD Future Land Use	1,873
Exposed Acreage: Institutional Future Land Use	23

Total Exposure: Land Value	\$926,691,147
Total Exposure: Building Value	\$1,409,897,440
Total Exposure: Assessed Value	\$2,402,551,188
Total Exposure: Taxable Value	\$1,928,001,263

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Oak Hill

Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in the report.



Oak Hill

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Castaway Lagoon	RV Park	AE
Jackson Hole Park	RV Park	AE
Lopez RV Park	RV Park	AE
Indian Mound Fish Camp	RV Park	AE
Mosquito Lagoon RV Park	RV Park	AE
Travis RV Park	RV Park	AE
Noel's Mobile Home Water Plant	Utility	AE
Riverwood Park Water Plant	Utility	AE

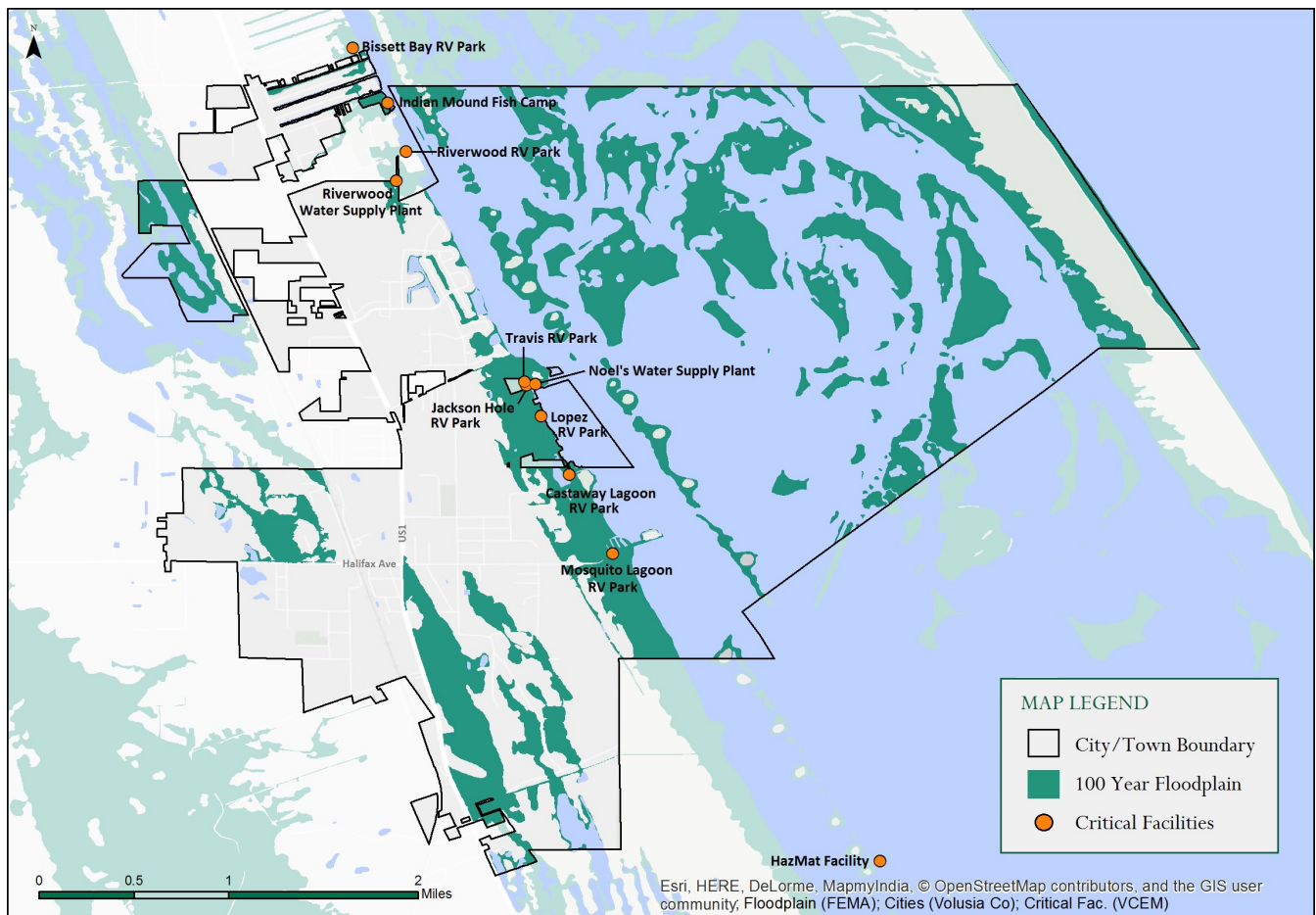
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	34.8%
Buildings in the Floodplain	399

Exposed Acreage: Residential Future Land Use	227
Exposed Acreage: Commercial Future Land Use	54
Exposed Acreage: Mixed Use Future Land Use	182
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	13

Total Exposure: Land Value	\$67,278,856
Total Exposure: Building Value	\$36,099,228
Total Exposure: Assessed Value	\$106,502,626
Total Exposure: Taxable Value	\$61,701,575

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Orange City

Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in this report.



Orange City

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
None		

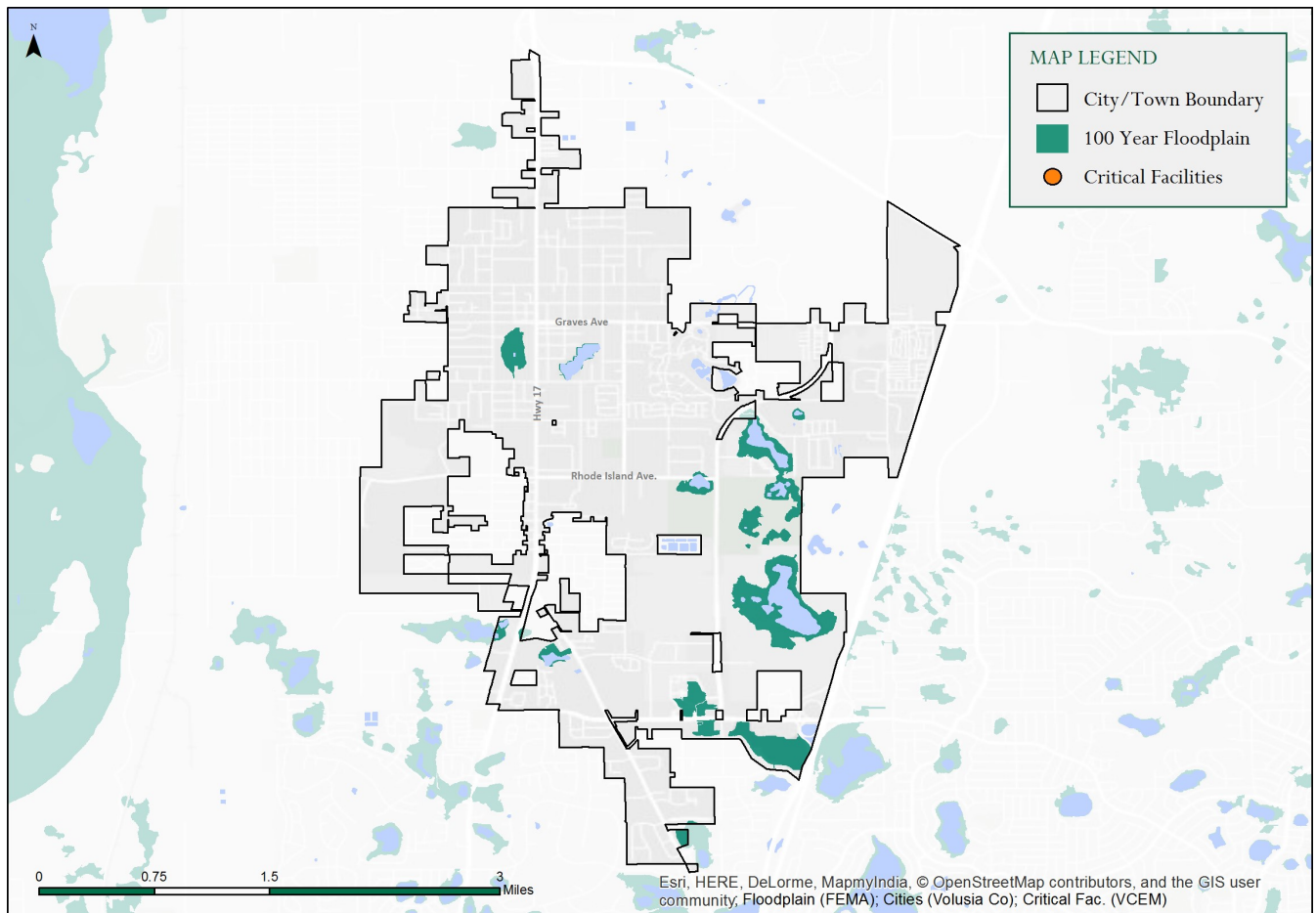
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	1.8%
Buildings in the Floodplain	33

Exposed Acreage: Residential Future Land Use	6
Exposed Acreage: Commercial Future Land Use	25
Exposed Acreage: Mixed Use Future Land Use	49
Exposed Acreage: Industrial Future Land Use	0.6
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	38

Total Exposure: Land Value	\$27,650,938
Total Exposure: Building Value	\$85,525,073
Total Exposure: Assessed Value	\$116,356,750
Total Exposure: Taxable Value	\$80,042,861

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Ormond Beach

Floodplain Management Goals and Objectives

Goal: Promote the public health, safety and general welfare, and to minimize public and private losses due to flooding through the regulation of development in flood hazard areas.

- Objective: Protect human life and health;
- Objective: Minimize or eliminate property damage;
- Objective: Minimize the need for future expenditure of public money for costly flood control projects and response to and recovery from flood events;
- Objective: Minimize unnecessary disruption of commerce, access and public service during times of flooding; Objective: Minimize damage to public and private facilities and utilities located in areas of special flood hazard;
- Objective: Help maintain a stable tax base by providing for the sound use and development of flood hazard area;
- Objective: Ensure that potential buyers are notified that property is in an area of special flood hazard;
- Objective: Require the use of appropriate construction practices in order to prevent or minimize future flood damage; and
- Objective: Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain.

Ormond Beach

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Seasons by Riviera	Assisted Living	AE
Southland Suites	Assisted Living	AE
Evergreen Assisted Living Facility	Assisted Living	A
Horizon Assisted Living Facility	Assisted Living	AH
Brookdale Ormond Beach West	Assisted Living	AE
CEMEX Ready Mix Plant	HazMat Facility	AE
Florida Power & Light Substation	HazMat Facility	A
Ormond Beach Fleet Operations	HazMat Facility	AE
Coquina Center	Medical	AE
Fleming Electric Substation	Utility	A
Ormond Electric Substation	Utility	AE
Ormond Solid Waste Transfer Facility	Waste Facility	AE
Daprile Property Solid Waste	Waste Facility	A
CEMEX Construct Materials Facility	Waste Facility	AE
Wastewater Treatment Plant	Waste Facility	AE

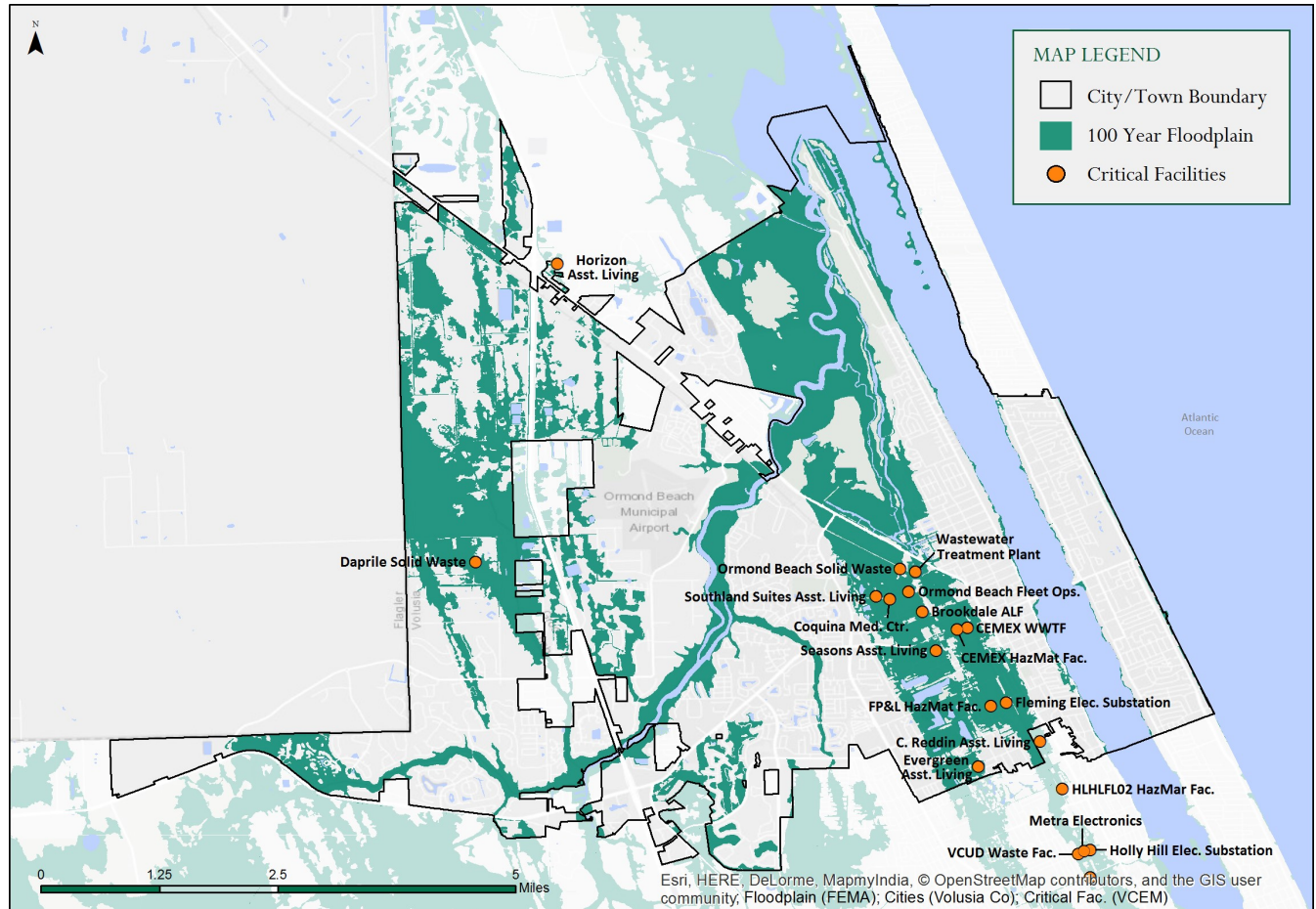
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	22.9%
Buildings in the Floodplain	3,235

Exposed Acreage: Residential Future Land Use	1,951
Exposed Acreage: Commercial Future Land Use	391
Exposed Acreage: Mixed Use Future Land Use	1,593
Exposed Acreage: Industrial Future Land Use	154
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	71

Total Exposure: Land Value	\$576,874,554
Total Exposure: Building Value	\$853,502,766
Total Exposure: Assessed Value	\$1,558,730,380
Total Exposure: Taxable Value	\$1,243,135,285

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Pierson

Floodplain Management Goals and Objectives

There are no additional goals to the countywide goals stated in the report.



Pierson

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Pole Barn State Facility	Government	A

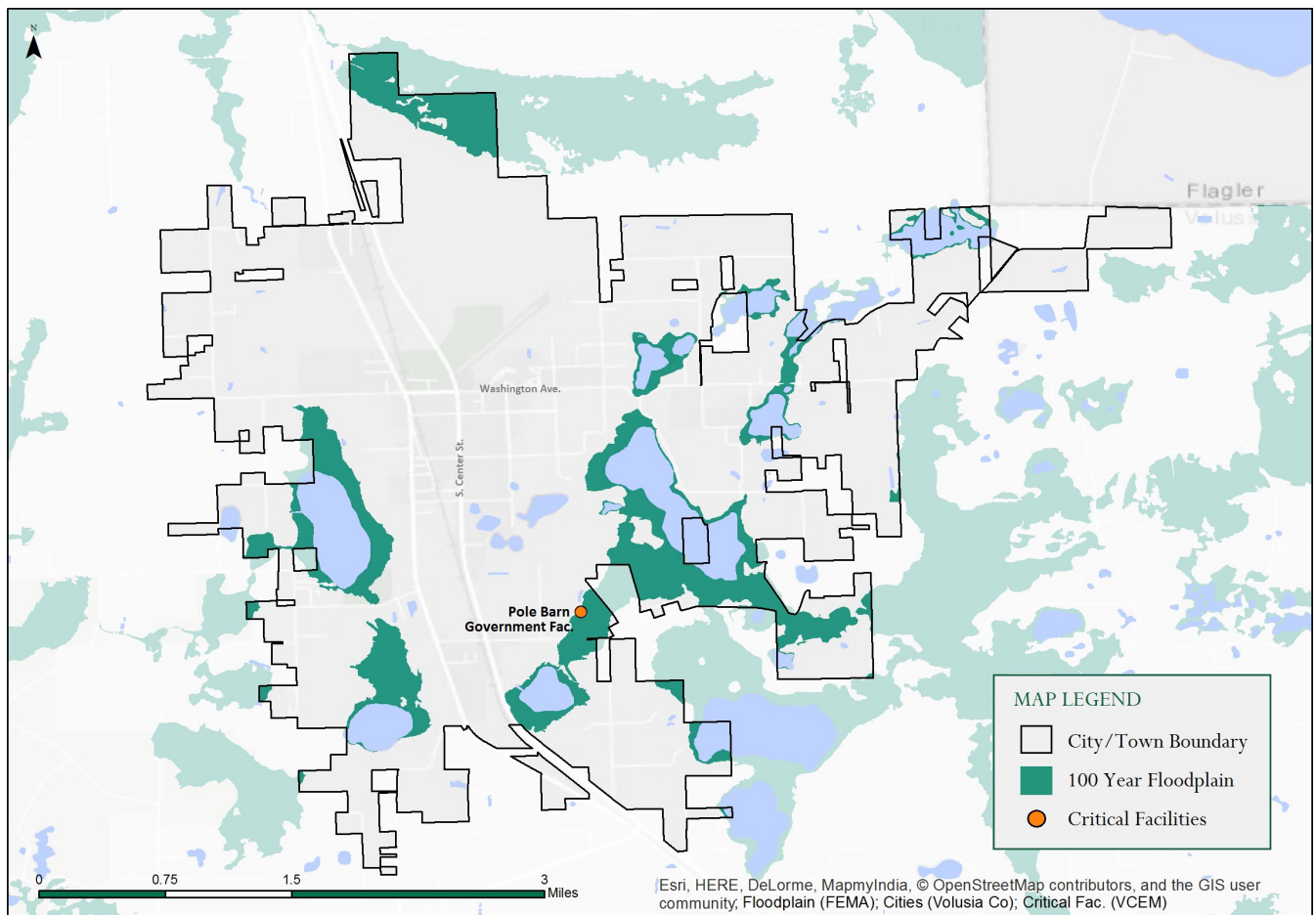
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	13.0%
Buildings in the Floodplain	70

Exposed Acreage: Residential Future Land Use	5
Exposed Acreage: Commercial Future Land Use	-
Exposed Acreage: Mixed Use Future Land Use	-
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	-

Total Exposure: Land Value	\$7,777,178
Total Exposure: Building Value	\$8,429,260
Total Exposure: Assessed Value	\$16,874,499
Total Exposure: Taxable Value	\$9,865,908

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain



Ponce Inlet



Floodplain Management Goals and Objectives

Goal: Conserve, protect, and restore coastal natural resources in order to maintain and enhance native habitats, floral and faunal species diversity, water quality, and natural surface water characteristics: and preserve and expand opportunities for the general public to access, use and enjoy the ocean beaches, the Halifax River, and other natural resource areas with passive and active recreational potential.

- Objective: Ensure the long-term protection, restoration and enhancement of the natural upland and wetland habitats of the coastal area, particularly areas identified as critical habitat for threatened and endangered species and species of special concern, through cooperation and coordination with federal, state and regional agencies, as well as Volusia County and adjoining coastal municipalities.
- Objective: Protect, conserve and enhance coastal resource wetlands, wildlife habitat and living marine resources by continued implementation of the LUDC's development regulations.
- Objective: The town shall permit the use of limited shoreline land areas based on type of water-dependent use, adjacent land use, water quality, impact on critical habitat and coastal resources and in accordance with the priorities for shoreline uses set forth in Policy 1.3.1.
- Objective: The town shall develop strategies to lessen the impact of a destructive storm on human life, property, public facilities and natural resources.
- Objective: Population concentrations shall be directed away from the Coastal High Hazard Area* (CHHA).
- Objective: Public facilities shall be prohibited that will encourage new development inside the CHHA, unless the facilities are consistent with policies specifically identified in this Comprehensive Plan.
- Objective: Prior to the development of public facilities in the CHHA, it shall be determined that there are no other feasible sites outside said area.
- Objective: If constructed, all public facilities in the CHHA shall be flood-proofed to ensure minimum damages from storms and hurricanes.
- Objective: The town shall regulate development that could impact natural dune systems by requiring developments to provide a plan that addresses that avoids disturbance to dunes if possible, and provides dune protection and stabilization measures, flood-proofing of utilities and requirements for structural wind resistance and floodplain management; Policy 1.4.6 - All development in the Hurricane Vulnerability Zone (HVZ) shall be consistent with the federal flood hazard requirements; Policy 1.4.7 - The town shall continue to participate in the National Flood Insurance Program (NFIP); Policy 1.4.8 - Any reconstruction or repair of the infrastructure necessitating state funds shall be designed to minimize potential damage (i.e., wind and/or flooding) from hurricanes or other storms; Policy 1.4.9 - The town, in accordance with Federal Emergency Management Agency requirements, shall adopt and implement a mitigation plan to reduce damage in areas of repetitive loss due to flooding; Policy 1.4.10 - The town shall continue to participation in the county's Emergency Management Service's "Local Mitigation Strategy" (LMS), as necessary and appropriate, through capital improvements programming and land development regulations in order to establish a continuing program of hurricane mitigation. The LMS is a result of a county-wide multi-jurisdictional program called Volusia 2020.
- Objective: In conjunction with Port Orange, Volusia County and Daytona Beach Shores, the town shall ensure that it maintains hurricane evacuation times at no more than 16 hours from the time of the first official order to evacuate during a Category 5 storm event as measured on the Saffir-Simpson scale prior to the consideration of any proposals to amend a Future Land Use designation that has the effect of increasing residential density in the community.

Goal: Protect, enhance, and restore the natural function of the beach and dune system.

- Objective: The town will continue to administer and enforce its comprehensive dune management program for the purpose of preserving and enhancing the existing dunes and stabilizing vegetation.
- Objective: The town shall coordinate with the East Central Florida Regional Planning Council, Volusia County and other coastal cities, as appropriate, in continually evaluating the long-term problems related to post-disaster redevelopment.

Ponce Inlet

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Inlet Harbor Restaurant/Marina	HazMat Facility	AE

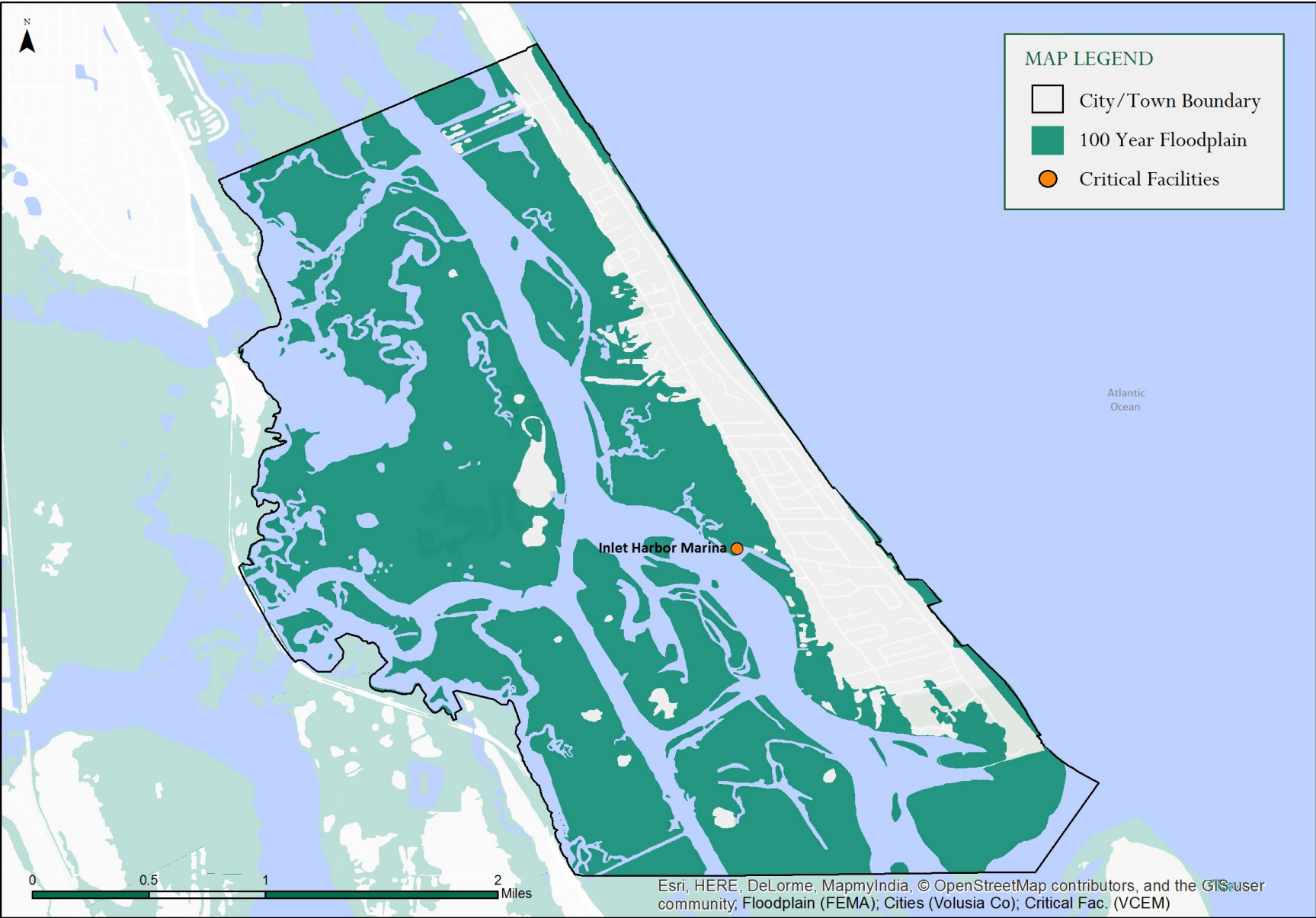
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	53.5%
Buildings in the Floodplain	328

Exposed Acreage: Residential Future Land Use	112
Exposed Acreage: Commercial Future Land Use	20
Exposed Acreage: Mixed Use Future Land Use	-
Exposed Acreage: Industrial Future Land Use	-
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	40

Total Exposure: Land Value	\$268,287,790
Total Exposure: Building Value	\$377,696,350
Total Exposure: Assessed Value	\$652,777,628
Total Exposure: Taxable Value	\$538,859,301

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Port Orange

Floodplain Management Goals and Objectives

Goal: Provide an efficient and effective drainage and storm water management system which, to the maximum extent practical, protects persons and property from flooding, prevents negative impacts to the groundwater aquifer, and safeguards surface waters against erosion and degradation of quality.

- Objective: To provide a storm water management level-of-service that will eliminate existing local flooding during the 25-year, 24-hour storm, and require all new development to provide storm water management facilities based on a 25-year, 24-hour storm event; *Policy:* Continue to utilize the Port Orange Master Drainage Plan, which establishes high water elevations, addresses existing deficiencies, and coordinates the construction of new facilities; *Policy:* Utilize the full carrying capacity of the existing culverts and ditches. The City will perform annual inspections of system elements to ascertain whether ditches have been maintained and culverts cleaned; *Policy:* Review on a yearly basis the priorities for replacement, correction of facility deficiencies, and provision of future drainage facility needs. These priorities will be based on those facilities that: 1) have failed or have a high probability of failure; and 2) will meet future capacity needs. The City shall establish a construction schedule for identified improvements in order to meet the future needs of flood control and storm water management.

Goal: Lessen the impact of a destructive storm on human life, property, public facilities and natural resources.

- Objective: To utilize land development regulations that minimizes danger to life and property; *Policy:* If constructed, all public facilities in the Coastal High Hazard Area, where necessary and appropriate, shall be flood-proof to ensure minimum damages from storms and hurricanes; *Policy:* City utility infrastructure shall be designed to withstand floods and wind damage associated with major storms and hurricanes. Furthermore, the City shall require, where necessary and appropriate, that electric, telephone, television cable, and other private utility infrastructure be designed to withstand flood and storm damage; *Policy:* Incorporate the recommendations of the Comprehensive Emergency Management Plan and the Local Mitigation Strategy (LMS), and other relevant interagency reports and agreements into the Comprehensive Plan and Land Development Code, as appropriate; *Policy:* Continue to participate in the county-wide Local Mitigation Strategy (LMS) program and implement the LMS, as necessary and appropriate, through capital improvements programming; *Policy:* Continue to participate in the National Flood Insurance Program (NFIP); *Policy:* Continue to pursue the improvement of Port Orange's insurance rating under the NFIP Community Rating System (CRS).

Goal: Conserve, protect, manage, restore, and enhance the City's air, water, and soil resources in order to maintain a living environment that supports a healthy population and does not cause illness.

- Objective: To protect, enhance and improve the ambient water quality of surface waters within the City; *Policy:* On-site waste treatment system facilities and drain fields shall not be located within 75 feet of the 100-year floodplain; within 75 feet of an upland/wetland interface; or within 120 feet of the mean high water mark of any surface water body, whichever is greater. On-site waste treatment systems should be located as far inland from a water body or wetland as possible.

Goal: Conserve, protect, manage, restore, and enhance the functional, aesthetic, and qualitative value of the natural environment for the benefit of present and future generations.

- Objective: To protect the natural function of the 100-year floodplains of Spruce Creek, the Halifax River, and their tributaries. In accordance with the provisions of the Comprehensive Plan, the City shall enforce development regulations, to maintain the capability of floodplains to carry, store and filter flood waters; *Policy:* Continue the use of the Conservation land use designation, as well as the Floodplain-Conservation (F-C) Zoning District, to protect the natural functions of floodplains and shorelines; *Policy:* Floodplains whose functional values have been degraded or destroyed through human intervention should be restored, if possible, through the public acquisition of historic floodplain lands. Various state, regional, and local acquisition programs shall be used for this purpose; *Policy:* No fill will be allowed in the Floodplain-Conservation (F-C) Zoning District that will decrease the flood carrying capacity of the riverine floodplain; *Policy:* No fill will be allowed in isolated floodplain pockets that will decrease the flood storage capacity of depressional wetlands; *Policy:* If any filling of land occurs during site design such that the volume of floodplain storage would be reduced, an equal volume of soil shall be excavated within the same floodplain to provide compensatory storage; *Policy:* Ensure that fill material or other structures do not adversely obstruct the natural movement of floodwater overland sheet flow or pose a threat to the public health, safety, and welfare; *Policy:* Encourage the development of a strict floodplain management program by state, regional, and local governments designed to preserve hydrologically significant wetlands and other natural floodplain features.

Port Orange

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Coquina Grove	Assisted Living	AE
Fran's Elderly Care	Assisted Living	AE
Portside Care Center	Assisted Living	AE
Port Orange HazMat Facility	HazMat Facility	AE
Port Orange Electric Substation	Utility	AE

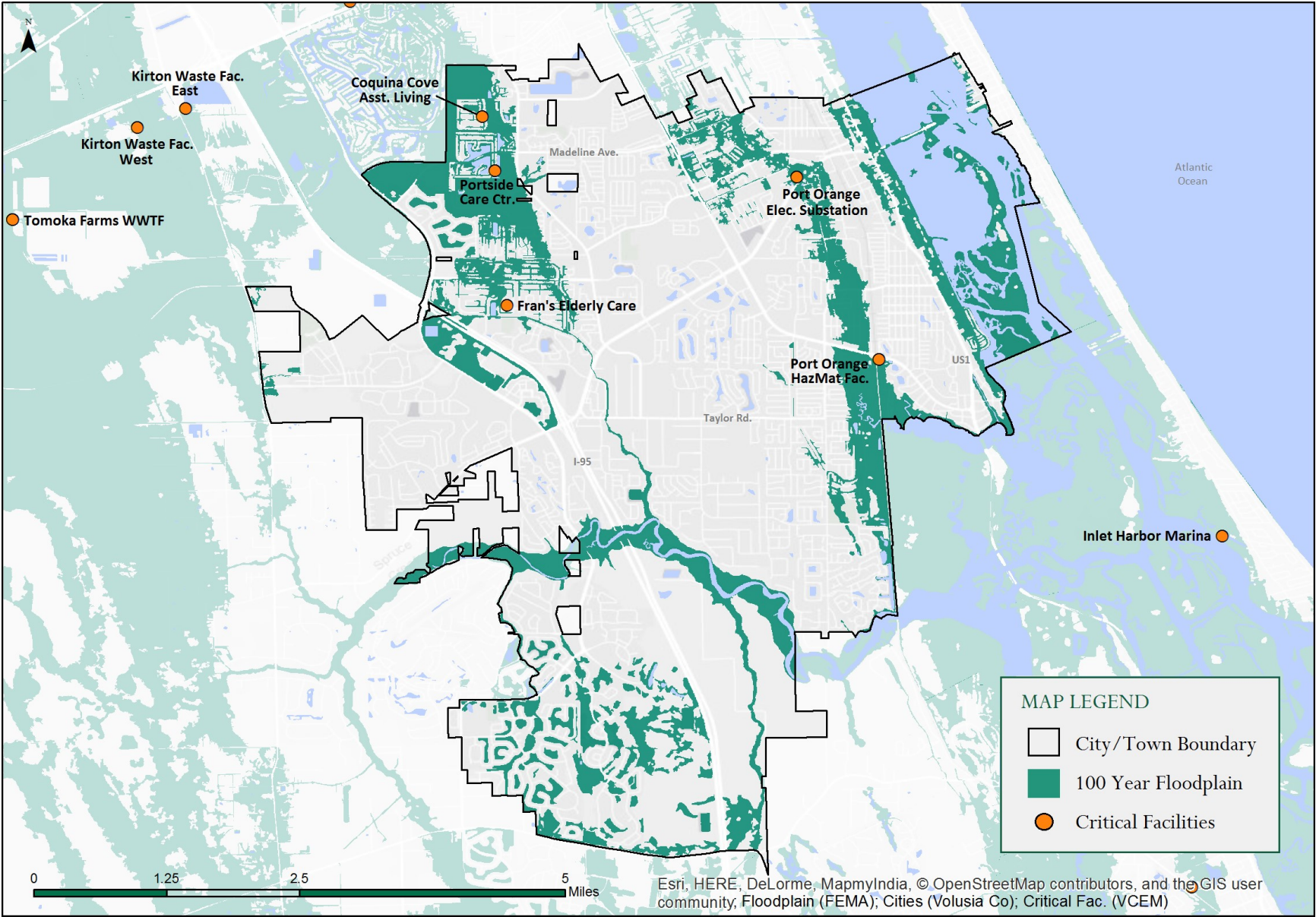
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	21.4%
Buildings in the Floodplain	4,496

Exposed Acreage: Residential Future Land Use	1,756
Exposed Acreage: Commercial Future Land Use	154
Exposed Acreage: Mixed Use Future Land Use	87
Exposed Acreage: Industrial Future Land Use	116
Exposed Acreage: PD Future Land Use	159
Exposed Acreage: Institutional Future Land Use	254

Total Exposure: Land Value	\$323,141,861
Total Exposure: Building Value	\$745,005,376
Total Exposure: Assessed Value	\$1,099,399,477
Total Exposure: Taxable Value	\$808,861,362

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





South Daytona

Floodplain Management Goals and Objectives

Goal: To protect human life and health through preparedness of emergency response teams from the Fire, Police and Public Works Departments;

Goal: Provide leadership in protecting residential properties and businesses from the impacts of floods by coordinating historical data with updated storm water management studies to identify possible flooding concerns;

Goal: To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public with proper planning and cost effective storm water improvements;

Goal: To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains through hardening facilities and Public Works Department preparedness;

Goal: To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blighted areas;

Goal: Provide advice and assistance to property owners by the Floodplain Manager and Chief Building Official, concerning the protection of their properties from flooding;

Goal: Maintain a Public awareness program that informs all property owners in the flood zones that they are located in a flood zone through mail-outs and web-site postings;

Goal: Maintain an aggressive grant program to identify and obtain funding for both pre and post disaster mitigation projects through the Community Development and the Ridgewood Corridor Re-Development Departments, and;

Goal: Create programs to manage the surface water runoff through maintaining an updated storm water management plan through the Public Works Department in conjunction with the Floodplain Manager and Chief Building Official.

South Daytona

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
South Daytona Christian Church	Shelter	A

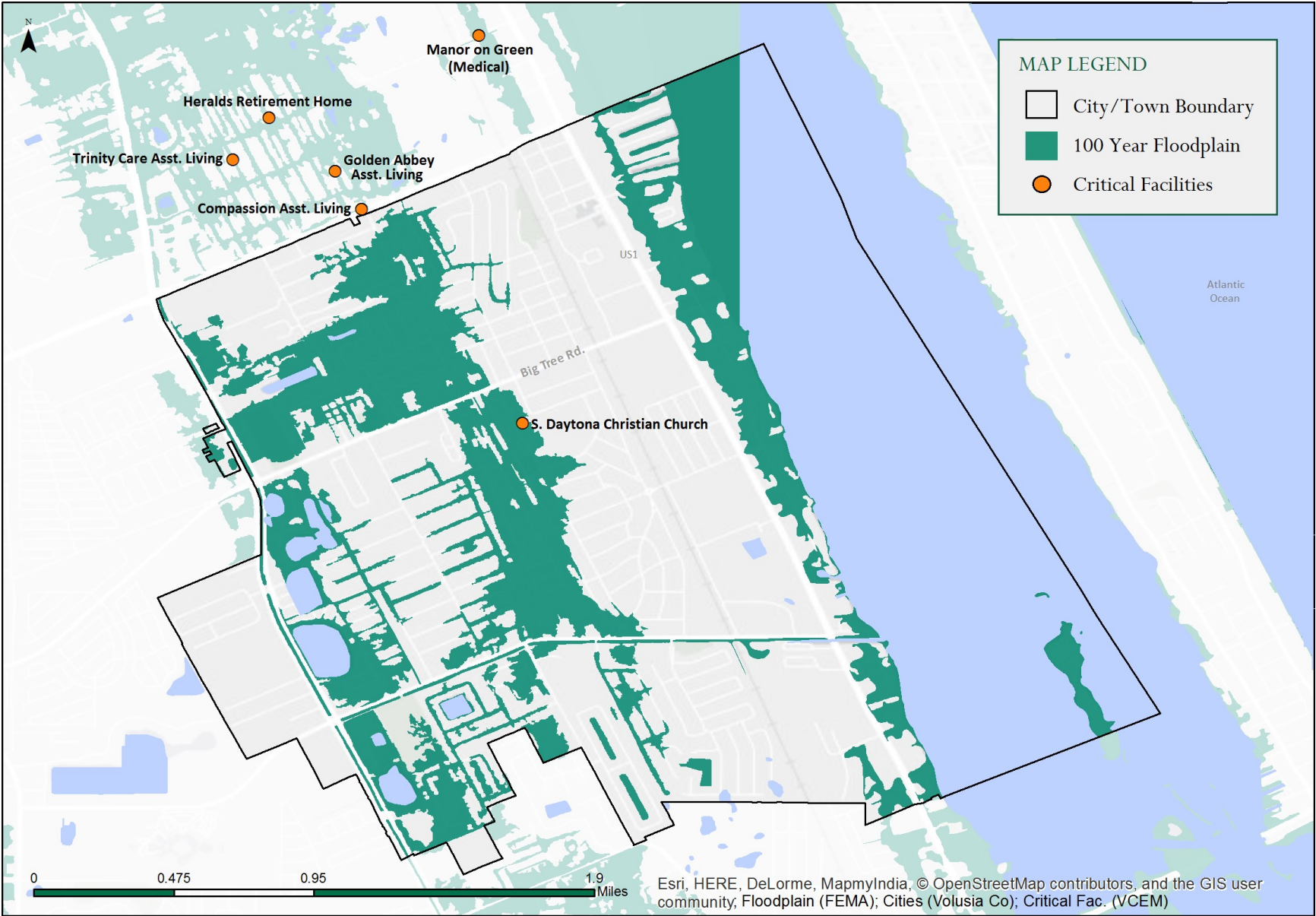
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	46.5%
Buildings in the Floodplain	2,262

Exposed Acreage: Residential Future Land Use	379
Exposed Acreage: Commercial Future Land Use	26
Exposed Acreage: Mixed Use Future Land Use	52
Exposed Acreage: Industrial Future Land Use	38
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	21

Total Exposure: Land Value	\$135,742,067
Total Exposure: Building Value	\$304,715,096
Total Exposure: Assessed Value	\$452,465,156
Total Exposure: Taxable Value	\$324,926,657

Jurisdiction Map: Critical Facilities within the 100-Year Floodplain





Unincorporated

Floodplain Management Goals and Objectives

Goal: Prevent new development in the floodplain from increasing runoff and resulting increases in flood volumes in the floodplain. Achieved through Volusia County Floodplain Development Ordinance, building permitting process and storm water management plans are on-going.

Goal: Develop a public awareness program that informs all property owners in the flood zones that they are located in a flood zone. Complete. Brochure is mailed annually to all 5,000 residents in the floodplain.

Goal: Provide advice and assistance to property owners concerning the protection of their properties from flooding, local drainage and sewer back-up problems. Information available and provided to property owners by Growth & Resource Management, Library, Public Presentations, Mail-outs – on-going.

Goal: Continue flood hazard mitigation program to identify and obtain funding for both pre-and-post disaster residential mitigation projects. Identify cost-beneficial residential units for various flood mitigation grants; Community Services shuttering program – ongoing.

Goal: Prioritize capital projects that will mitigate flood impacts in those areas of the County that have experienced significant flooding problems. Stormwater drainage programs – on-going.

Goal: Utilize “Volusia Prepares” Local Mitigation Strategy to guide and assist the County in establishing priorities for flood hazard mitigation projects. LMS Steering Committee meets quarterly to review mitigation initiatives and identify potential funding sources – on-going.

Goal: Review the locations and effects on areas that experience flooding and determine what steps, if any, the County can take to alleviate future impacts. Stormwater conducts inspections of flood prone areas to determine best mitigation activities – on-going.

Goal: Develop Floodplain Management Plans for participating CRS municipalities in Volusia County (and others as desired). Complete. Plan is in the adoption phase by all 16 municipalities and unincorporated Volusia County.

Unincorporated

Exposed Critical Facilities

Facility Name	Facility Type	Flood Zone
Coe Field	Airport	A
Cross Creek Farms Stolport	Airport	A
Correan Reddin	Assisted Living	A
Driveway Maintenance Facility	HazMat Facility	AE
Samsula HazMat Facility 812949	HazMat Facility	A
Florida Public Utilities Operation Center	HazMat Facility	AE
Southwest Livestock Barn/Pavilion	Government	A
Volusia County Fairgrounds	Government	A
Tomoka Work Camp	Jail	A
Cypress Point Resort	RV Park	A
New Smyrna Beach Campground	RV Park	A
Lake Beresford RV Park	RV Park	AE
Stoughton's Pine Island Campground	RV Park	AE
Pine Island Campground and Marina	RV Park	AE
Sugar Mill Ruins RV Park	RV Park	AE
Cypress Point Golf Club	RV Park	A
Riverwood Park Campground	RV Park	AE
Bissett Bay RV Park	RV Park	AE
Tropical Resort & Marina	RV Park	AE
Haven Recovery Center Utility	Utility	A
Mike's Corner Utility	Utility	A
Sugar Mill Ruins Utility	Utility	AE
Osteen C&D	Waste Facility	A
Kirton Self C&D West	Waste Facility	A
La Iglesia Del Senior	Waste Facility	A
Franklin Gregg Property	Waste Facility	A
Kirton C&D Landfill East	Waste Facility	A
Airport Used Parts Salvage Yard	Waste Facility	AE
Blair's Jungle Den	Waste Facility	AE
St. Johns River Club Condo WWTP	Waste Facility	AE
Sugar Mill Ruins WWTP	Waste Facility	AE
Samsula Academy WWTP	Waste Facility	A
Kove Estates Facility	Waste Facility	A
Hontoon Island Park Facility	Waste Facility	AE
Holly Bluff Marina	Waste Facility	AE
Pine Island WWTP	Waste Facility	AE
Sugar Mill Mobile Home Park WWTP	Waste Facility	A
New Hope Villas WWTP	Waste Facility	A
Pine Island STP	Waste Facility	AE
Tomoka Farms Landfills (2)	Waste Facility	A

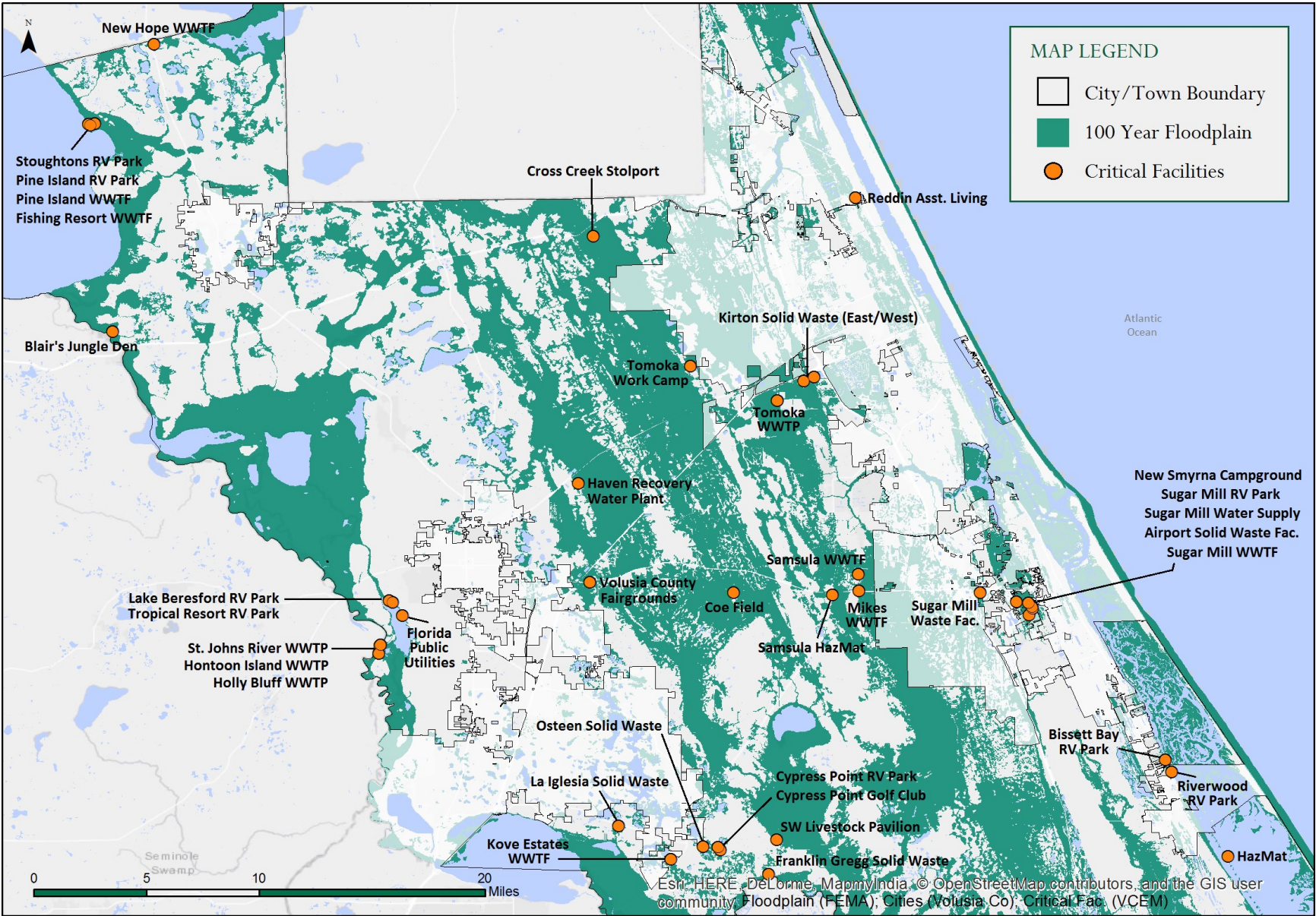
Floodplain Exposure Analysis

Percent of Parcels in the Floodplain	38.3%
Buildings in the Floodplain	10,229

Exposed Acreage: Residential Future Land Use	12,809
Exposed Acreage: Commercial Future Land Use	138
Exposed Acreage: Mixed Use Future Land Use	72
Exposed Acreage: Industrial Future Land Use	227
Exposed Acreage: PD Future Land Use	-
Exposed Acreage: Institutional Future Land Use	3,180

Total Exposure: Land Value	\$2,172,644,221
Total Exposure: Building Value	\$2,111,056,027
Total Exposure: Assessed Value	\$4,399,426,257
Total Exposure: Taxable Value	\$2,737,889,450

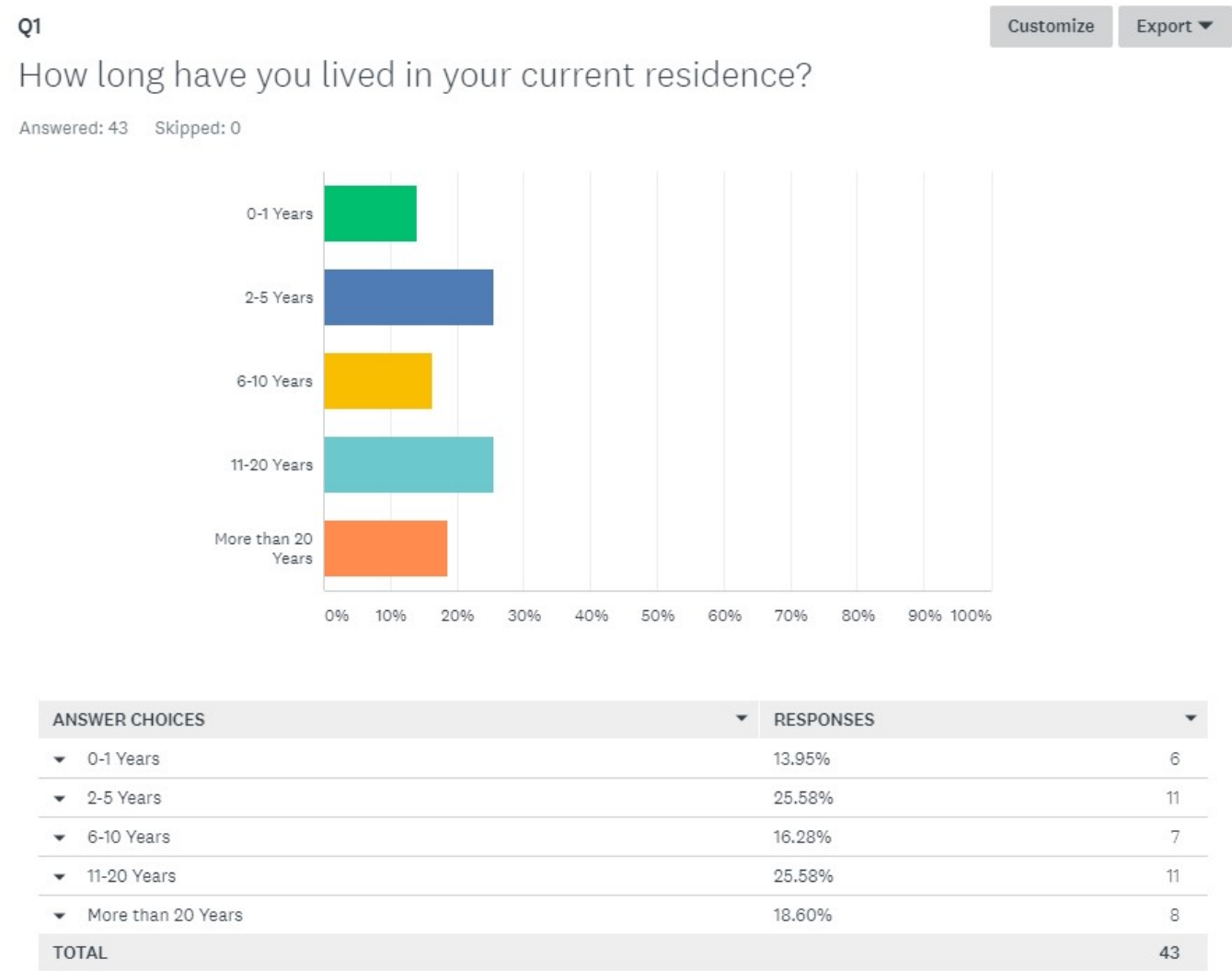
Jurisdiction Map: Critical Facilities within the 100-Year Floodplain (Map only depicts vulnerable critical facilities in unincorporated areas)



Appendix B Public Survey



The following statistics were compiled for each of the questions on the Public Survey:



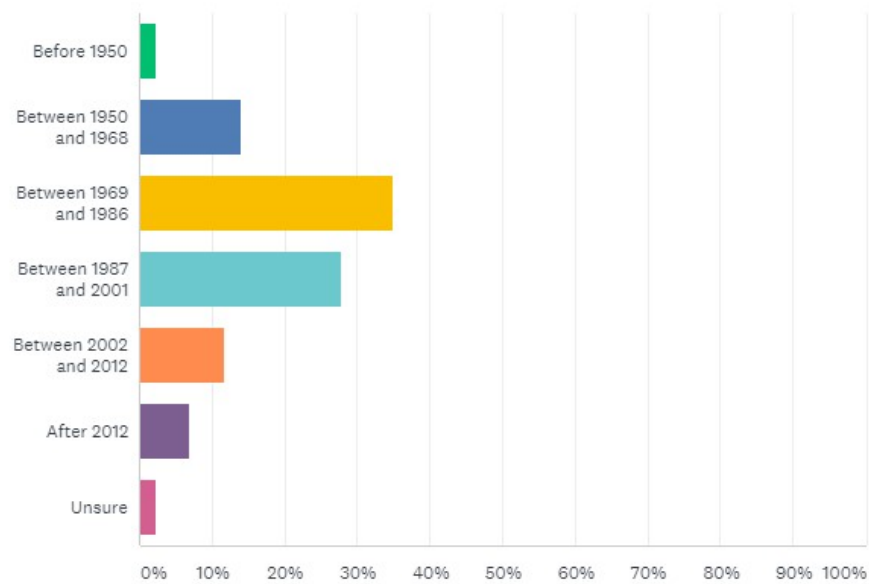
Q2

Customize

Export ▼

In what year was your home built?

Answered: 43 Skipped: 0



ANSWER CHOICES ▼	RESPONSES ▼	
▼ Before 1950	2.33%	1
▼ Between 1950 and 1968	13.95%	6
▼ Between 1969 and 1986	34.88%	15
▼ Between 1987 and 2001	27.91%	12
▼ Between 2002 and 2012	11.63%	5
▼ After 2012	6.98%	3
▼ Unsure	2.33%	1
TOTAL		43

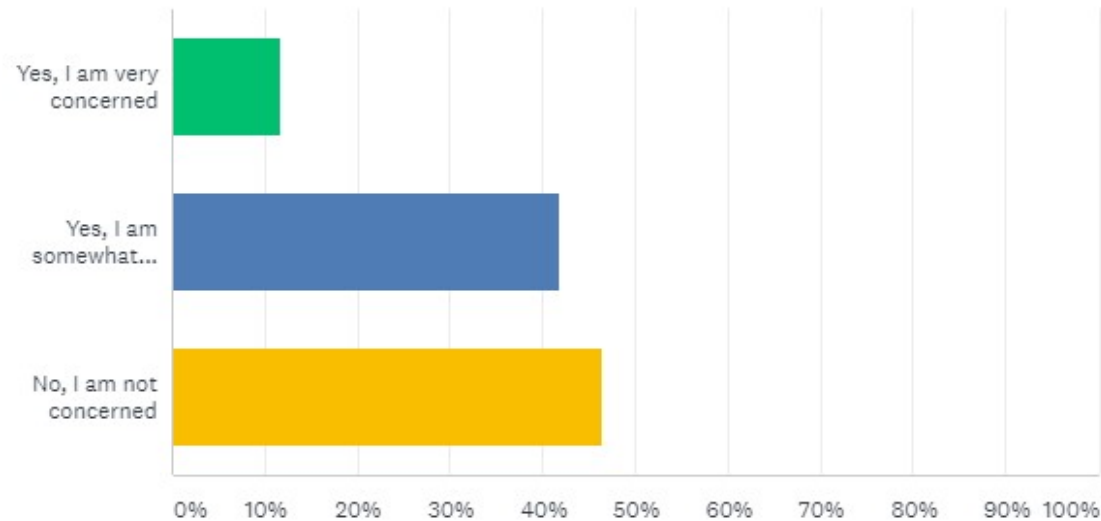
Q3

Customize

Export ▼

Are you concerned about the possibility of your home being flooded?

Answered: 43 Skipped: 0



ANSWER CHOICES	RESPONSES	
▼ Yes, I am very concerned	11.63%	5
▼ Yes, I am somewhat concerned	41.86%	18
▼ No, I am not concerned	46.51%	20
TOTAL		43

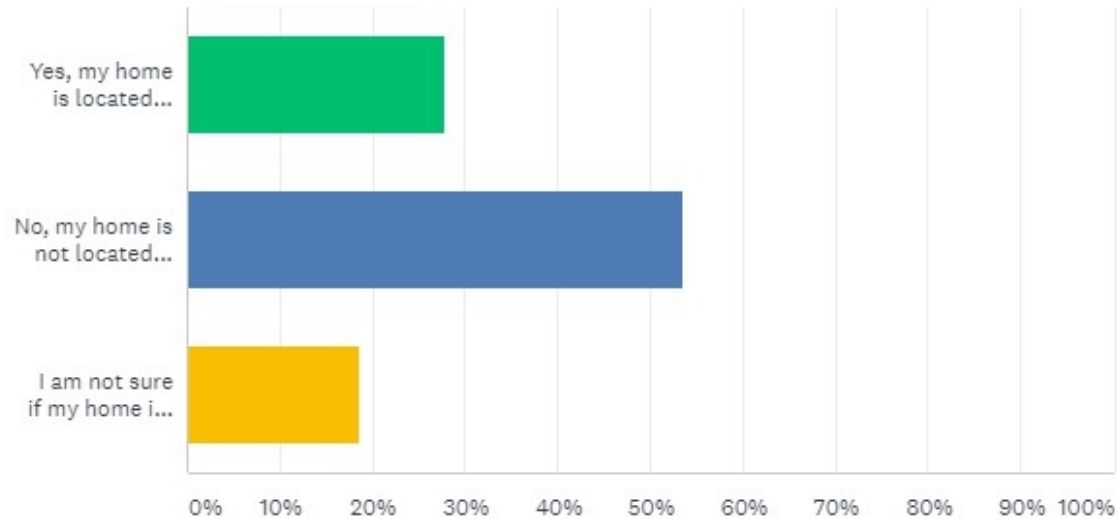
[Comments](#) (9)

Q4

Customize Export ▼

Is your home located within a designated flood hazard zone (floodplain)?

Answered: 43 Skipped: 0



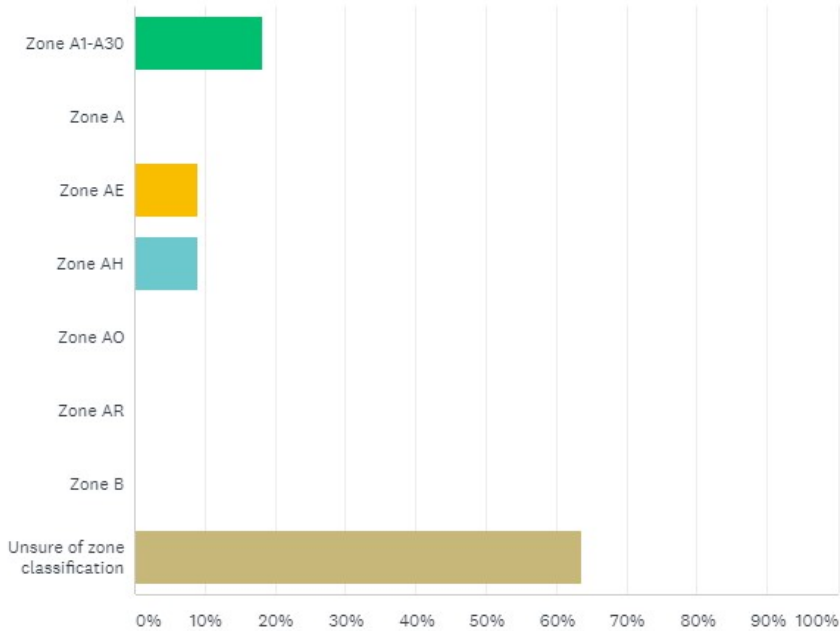
ANSWER CHOICES	RESPONSES	
▼ Yes, my home is located within a designated flood hazard zone.	27.91%	12
▼ No, my home is not located within a designated flood hazard zone.	53.49%	23
▼ I am not sure if my home is located within a designated flood zone.	18.60%	8
TOTAL		43

Q5

Customize Export

Which flood zone is your property located in?

Answered: 11 Skipped: 32



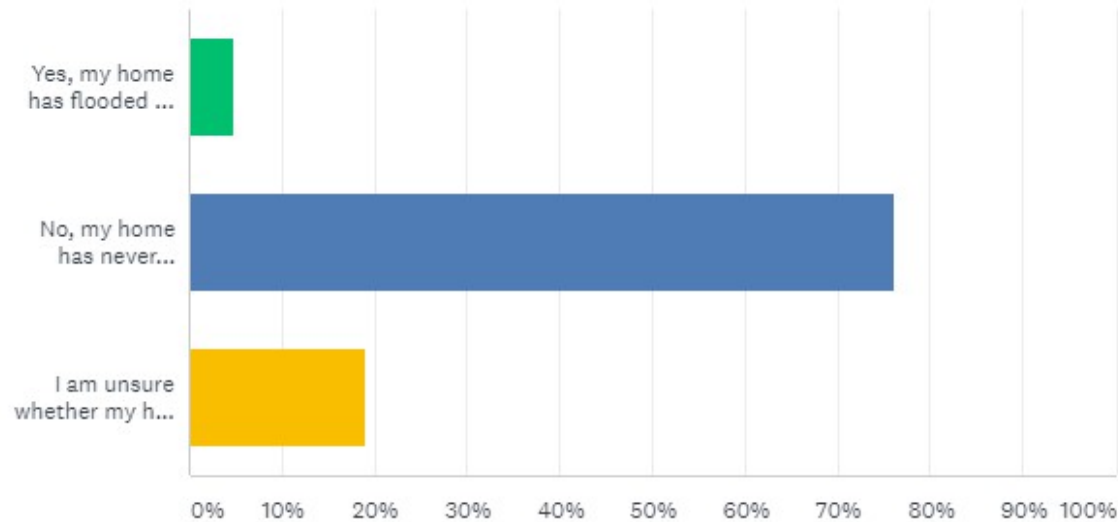
ANSWER CHOICES	RESPONSES
Zone A1-A30	18.18% 2
Zone A	0.00% 0
Zone AE	9.09% 1
Zone AH	9.09% 1
Zone AO	0.00% 0
Zone AR	0.00% 0
Zone B	0.00% 0
Unsure of zone classification	63.64% 7
TOTAL	11

Q6

Customize Export

Has your home ever flooded due to natural/environmental causes?

Answered: 42 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes, my home has flooded due to natural/environmental causes.	4.76%	2
No, my home has never flooded due to natural/environmental causes.	76.19%	32
I am unsure whether my home has experienced flooding due to natural/environmental causes.	19.05%	8
TOTAL		42

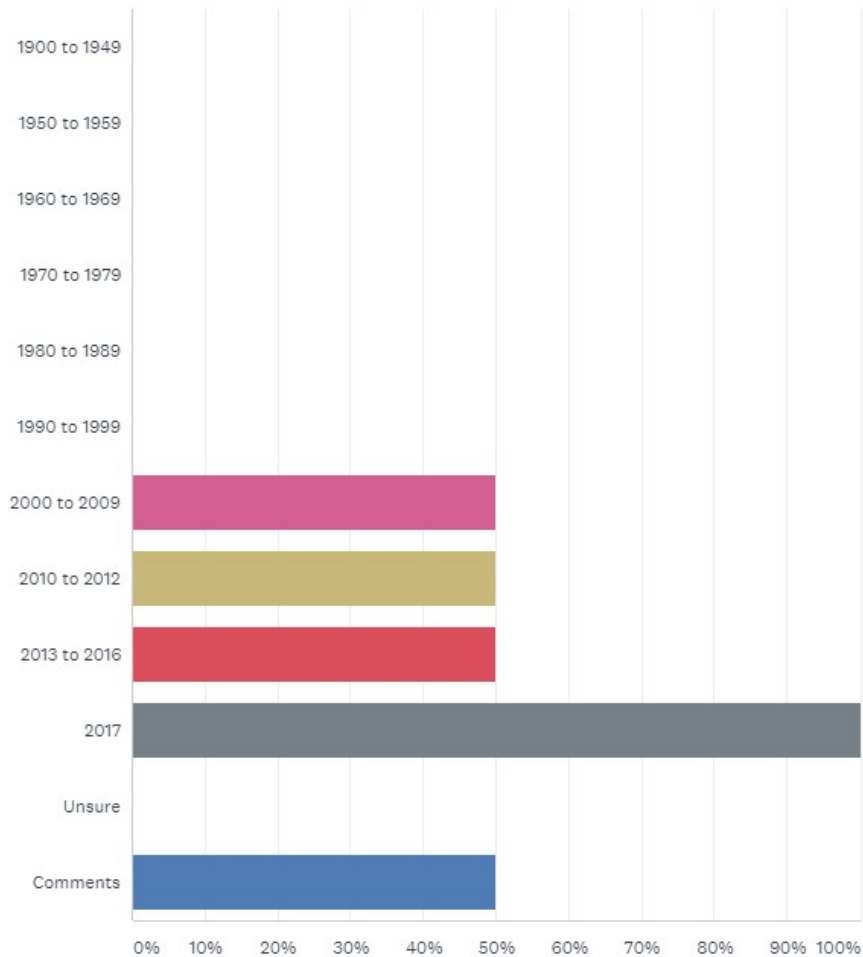
Comments (5)

Q7

Customize Export

To your best knowledge, during which time period did your home last flood?
(Check all that apply)

Answered: 2 Skipped: 41



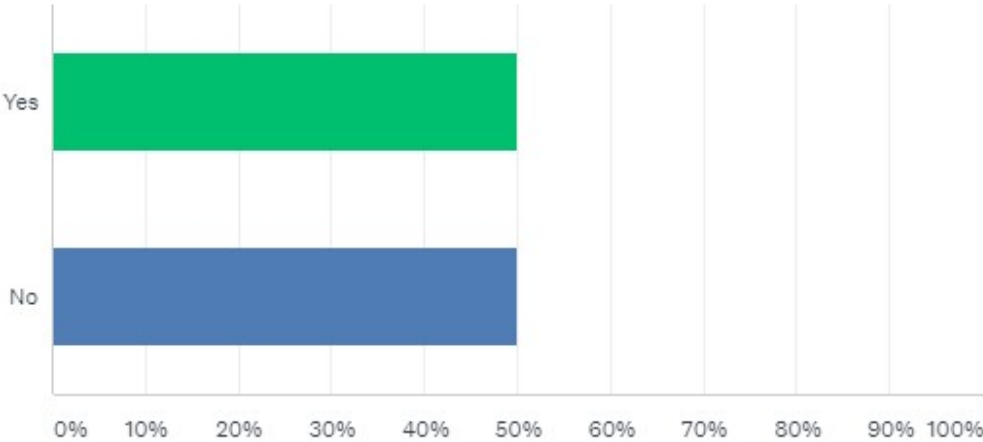
Q8

Customize

Export ▼

Have you seen an increase in the duration and frequency of these flood events?

Answered: 2 Skipped: 41



ANSWER CHOICES	RESPONSES	
Yes	50.00%	1
No	50.00%	1
TOTAL		2

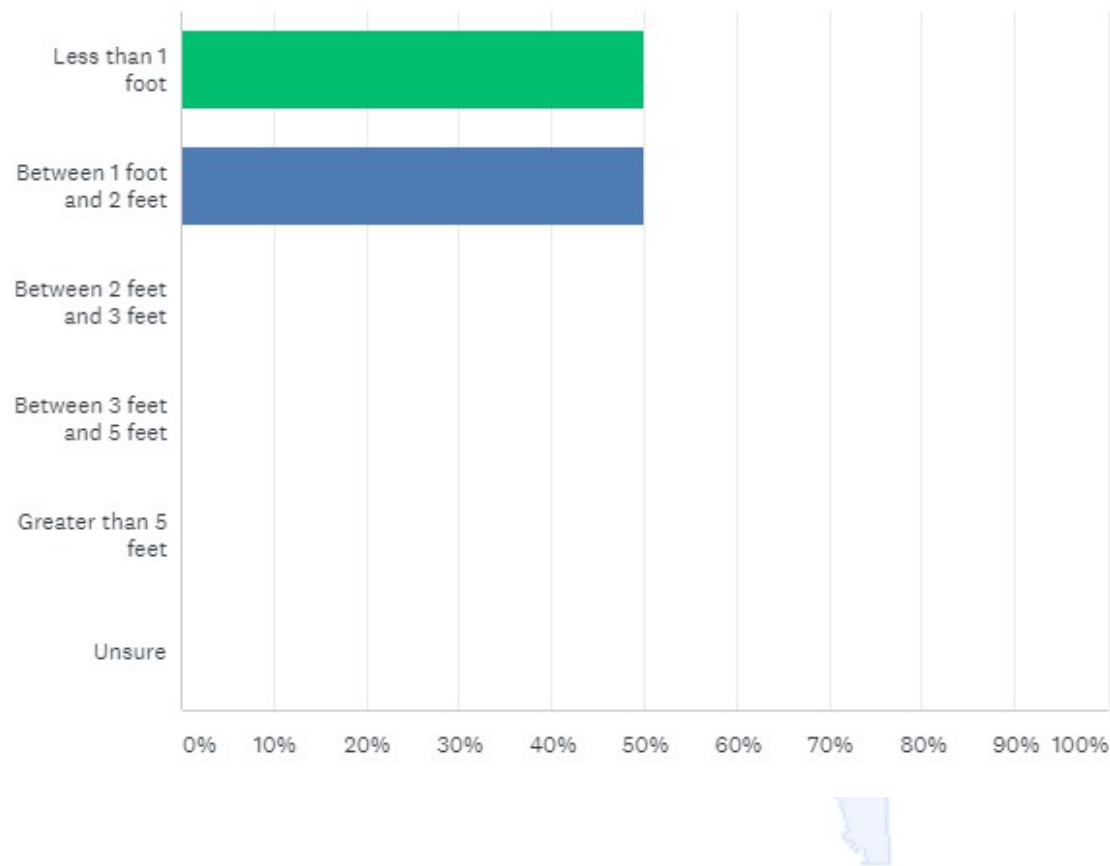


Q9

Customize Export

What was the depth of the water in your home during the your last flooding event noted in previous question?

Answered: 2 Skipped: 41



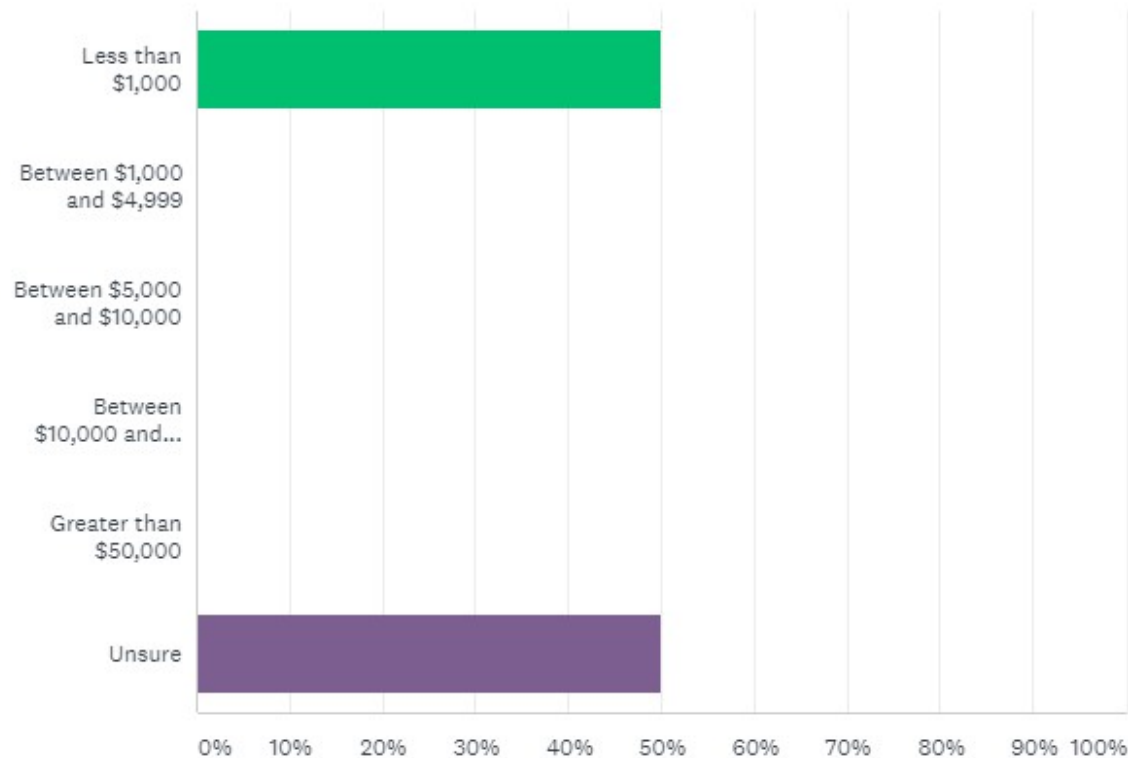
Q10

Customize

Export ▼

What was the approximate dollar value of all structural damages to your home during the last flooding event?

Answered: 2 Skipped: 41



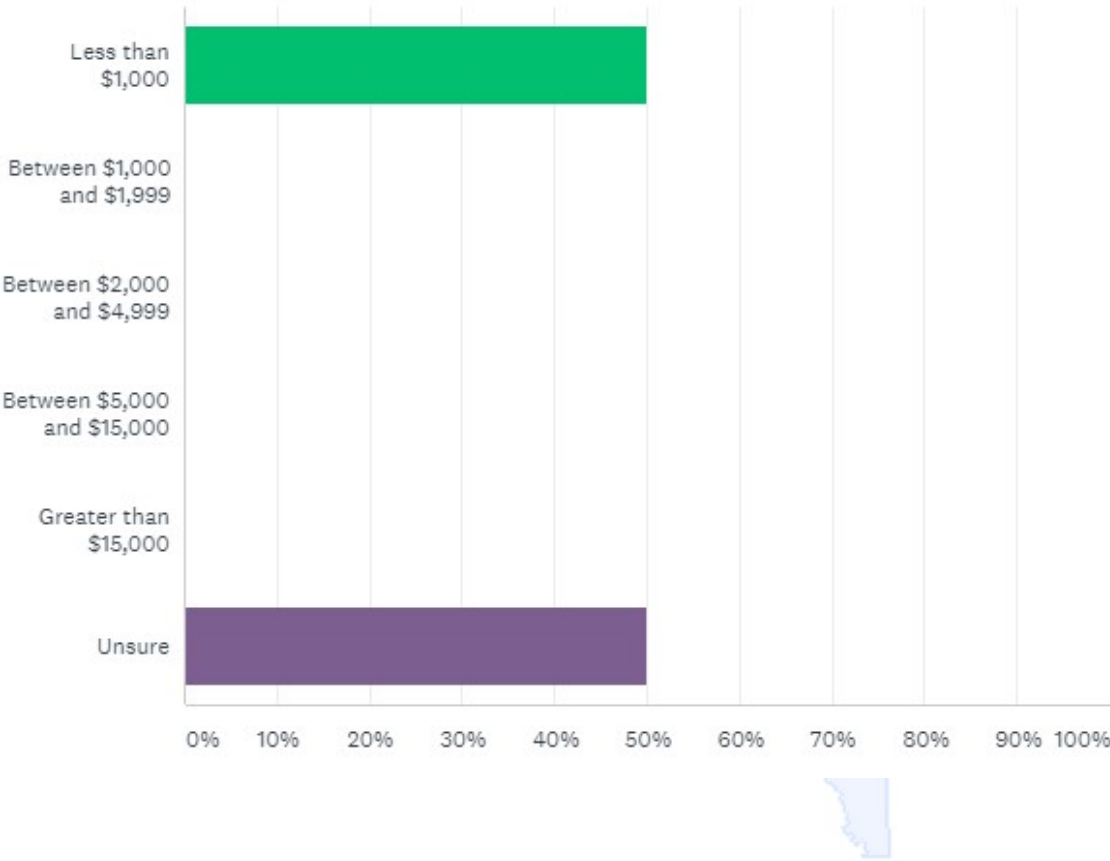
Q11

Customize

Export ▼

What was the approximate dollar value of all personal items lost during the last flooding event?

Answered: 2 Skipped: 41

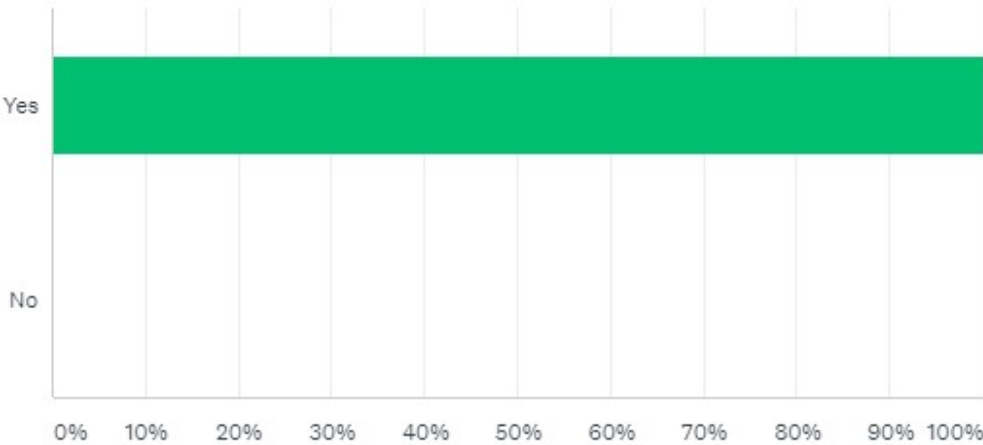


Q12

Customize Export

Has local roadway flooding (in your neighborhood) directly impacted access to your property?

Answered: 2 Skipped: 41



ANSWER CHOICES	RESPONSES	
Yes	100.00%	2
No	0.00%	0
TOTAL		2

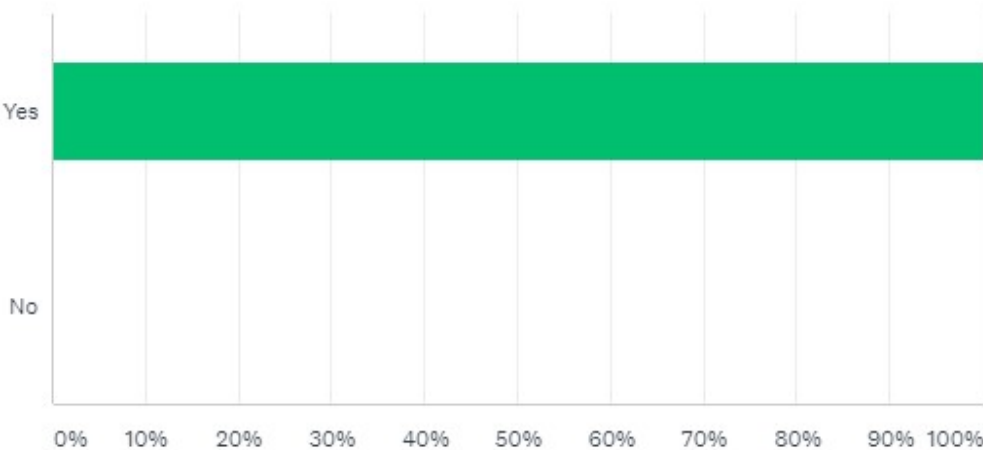


Q13

Customize Export

Have you seen an increase in the duration and frequency of these flood events?

Answered: 2 Skipped: 41



ANSWER CHOICES	RESPONSES	
Yes	100.00%	2
No	0.00%	0
TOTAL		2

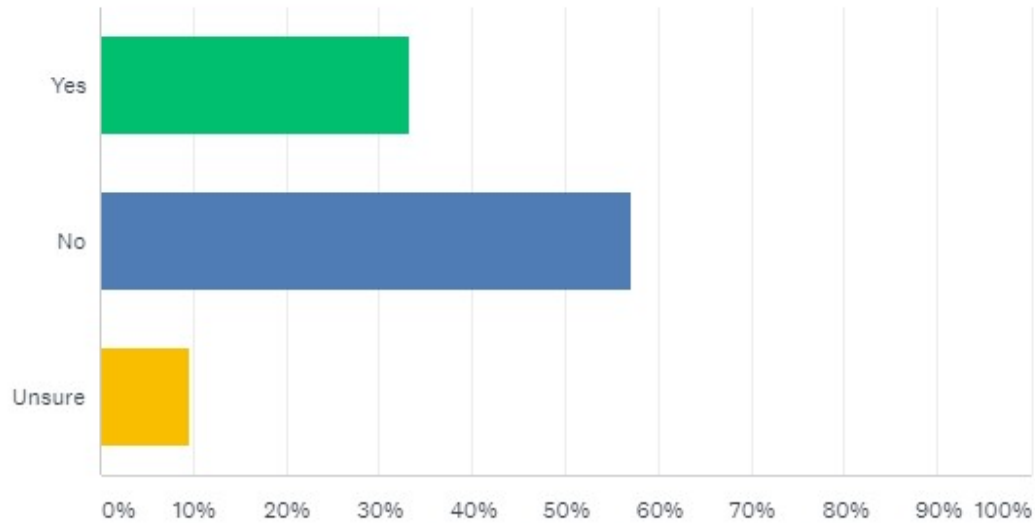


Q14

Customize Export ▼

Do you currently have flood insurance for your property?

Answered: 42 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	33.33%	14
No	57.14%	24
Unsure	9.52%	4
TOTAL		42

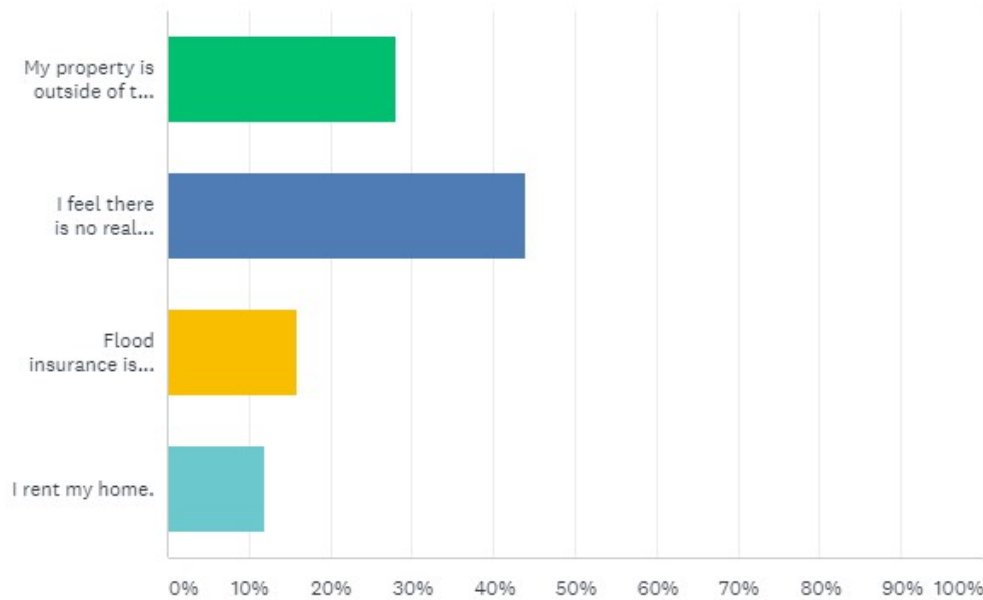
Comments (1)

Q15

Customize Export

Which of the following reasons best describes why you do not have flood insurance?

Answered: 25 Skipped: 18



ANSWER CHOICES	RESPONSES	
My property is outside of the floodplain.	28.00%	7
I feel there is no real threat of a flood on my property.	44.00%	11
Flood insurance is too expensive.	16.00%	4
I rent my home.	12.00%	3
TOTAL		25

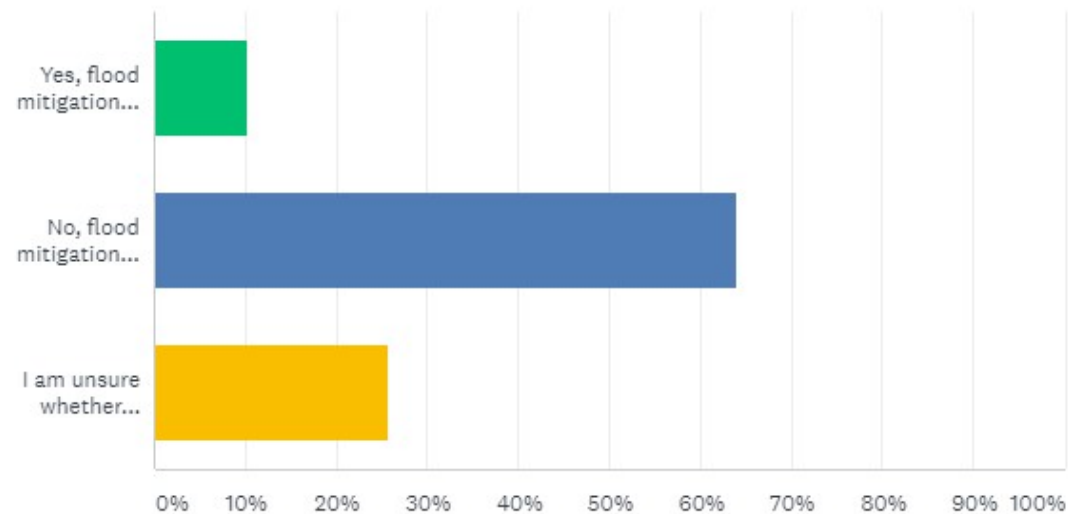
Q16

Customize

Export ▼

Have any flood mitigation efforts been implemented to your property? (i.e. steps taken to remedy or improve structural vulnerability to flooding or flood proofing your home)

Answered: 39 Skipped: 4



ANSWER CHOICES ▼	RESPONSES ▼	
▼ Yes, flood mitigation efforts have been implemented on my property.	10.26%	4
▼ No, flood mitigation efforts have not been implemented on my property.	64.10%	25
▼ I am unsure whether mitigation efforts have been implemented on my property.	25.64%	10
TOTAL		39

Q17

Export ▼

Describe the mitigation efforts conducted on your property.

Answered: 4 Skipped: 39

RESPONSES (4)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



Showing 4 responses



We built higher than 100 yr. flood plain

6/15/2018 10:38 PM

[View respondent's answers](#)[Add Tags ▼](#)

Grading of land on front of property away from home and towards a retention pond.

6/14/2018 5:55 PM

[View respondent's answers](#)[Add Tags ▼](#)

Bottom floor is parking and access only

6/12/2018 4:30 PM

[View respondent's answers](#)[Add Tags ▼](#)

HOA has retention areas and waterways continually upgraded

6/6/2018 12:30 PM

[View respondent's answers](#)[Add Tags ▼](#)

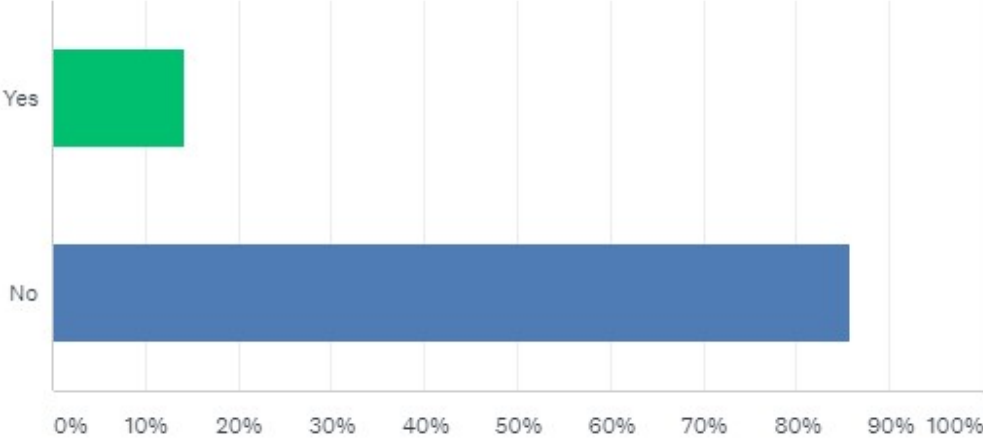
Q18

Customize

Export ▼

Have you considered implementing flood management strategies on your property?

Answered: 35 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	14.29%	5
No	85.71%	30
TOTAL		35



Q19

Export ▼

What mitigation strategies have you considered to implement and/or what is your biggest hold-back to implementing mitigation strategies?

Answered: 13 Skipped: 30

RESPONSES (13)

TEXT ANALYSIS

TAGS (0)

☐

Add Tags ▼

Filter by Tag ▼

Search responses



Showing 13 responses

☐

It is 19 feet above the adjacent lake mean high water mark and been thru hurricanes and did not flood.

6/15/2018 2:21 PM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

This is a multi-family (townhouse) dwelling, so all homeowners would need to agree on a strategy, and that does not seem likely at this time.

6/15/2018 9:24 AM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

We don't feel anything would work because the entire neighborhood, street and adjacent yards flood

6/13/2018 4:39 PM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

property is owned by apartment complex and too expensive

6/13/2018 2:42 PM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

Unknown

6/13/2018 2:16 PM

[View respondent's answers](#)
[Add Tags ▼](#)

Q19

Export ▼

What mitigation strategies have you considered to implement and/or what is your biggest hold-back to implementing mitigation strategies?

Answered: 13 Skipped: 30

RESPONSES (13)

TEXT ANALYSIS

TAGS (0)

☐

Add Tags ▼

Filter by Tag ▼

Search responses



Showing 13 responses

☐

I'm in Zone AX, elevation 28'

6/6/2018 1:30 PM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

Prepare for a flood by moving important items to a higher location.

6/5/2018 6:23 PM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

n/a

6/5/2018 11:46 AM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

Future plans include a French drain to help with severe tropical rainfall. Not a huge concern since I have only seen the area slow to drain twice in 22 years.

6/5/2018 11:09 AM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

Not sure what the options are

6/5/2018 10:44 AM

[View respondent's answers](#)
[Add Tags ▼](#)
☐

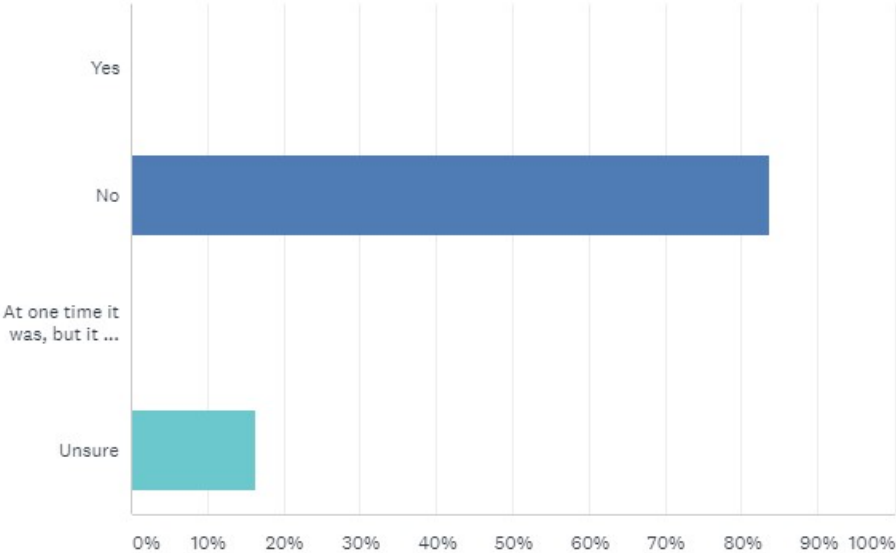
Building a berm. Time and money

Q20

Customize Export

Is your home currently classified as a repetitive flood loss property (defined as a structure that has experienced two floods in the last ten years with at least \$1,000 in damages per event)?

Answered: 37 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	83.78%	31
At one time it was, but it has been removed due to mitigation.	0.00%	0
Unsure	16.22%	6
TOTAL		37

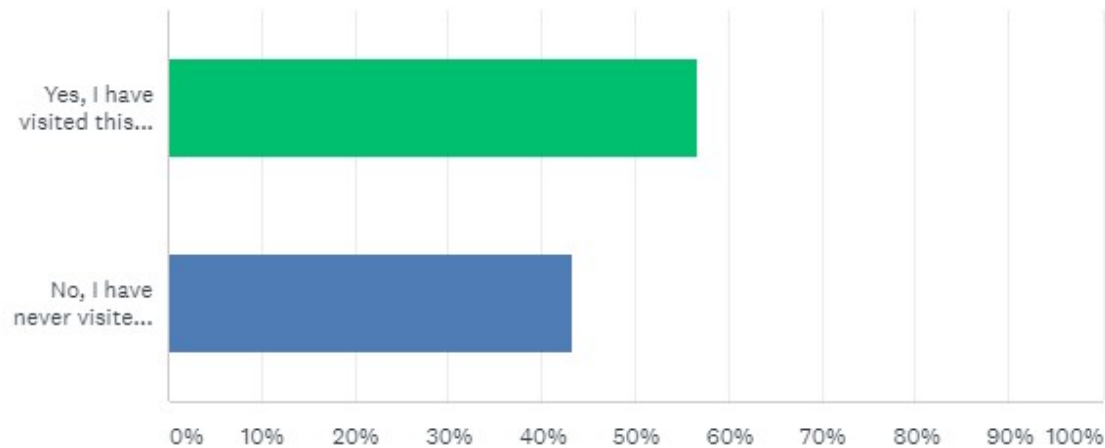
Comments (0)

Q21

Customize Export

Did you know that you can view the current flood plain and other County-wide resources at the following web site:
<http://www.volusia.org/services/public-protection/emergency-management>

Answered: 37 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes, I have visited this web site	56.76%	21
No, I have never visited this web site	43.24%	16
TOTAL		37

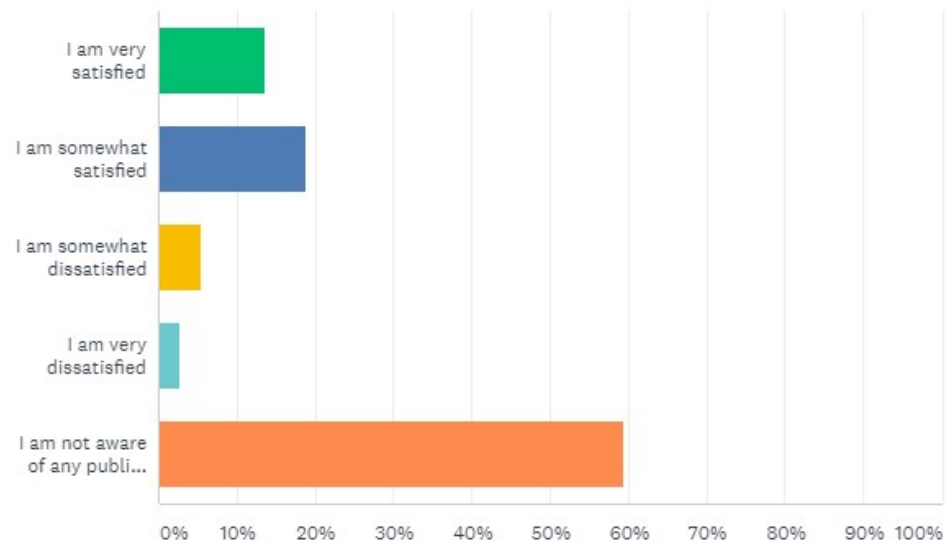
Comments (0)

Q22

Customize Export

How satisfied are you with how your jurisdiction handles public involvement and outreach concerning flood hazards in your area?

Answered: 37 Skipped: 6

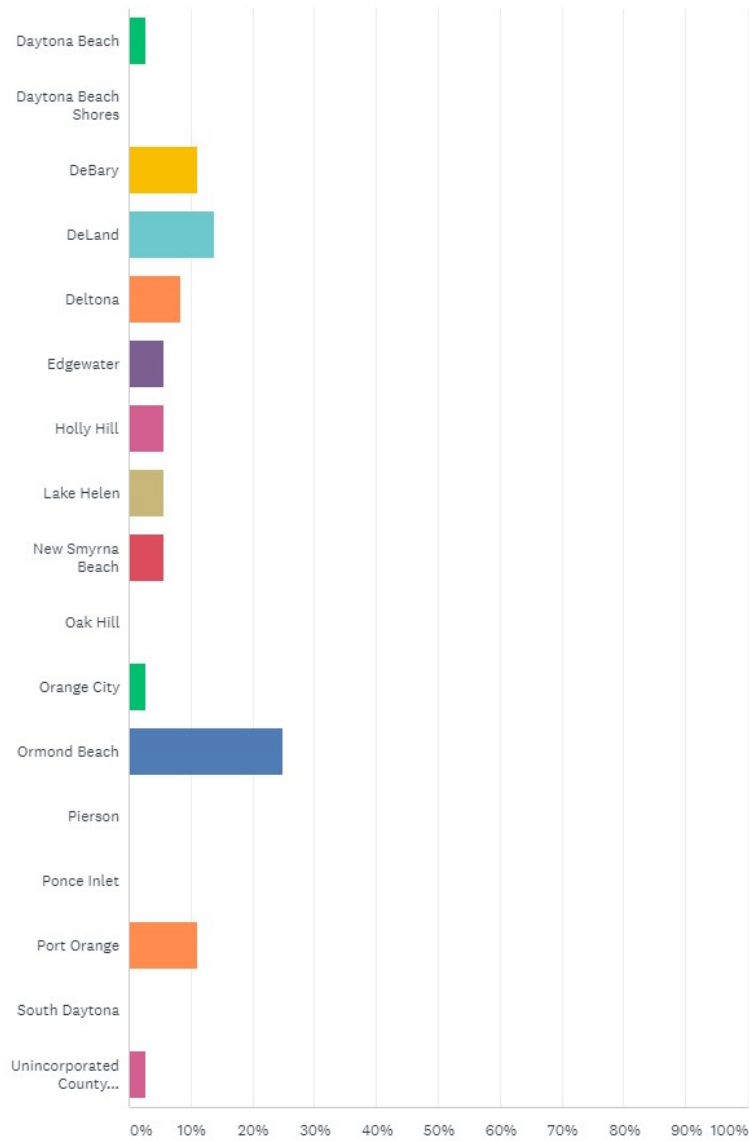


ANSWER CHOICES	RESPONSES	
I am very satisfied	13.51%	5
I am somewhat satisfied	18.92%	7
I am somewhat dissatisfied	5.41%	2
I am very dissatisfied	2.70%	1
I am not aware of any public involvement/outreach efforts concerning flood hazards conducted by my jurisdiction	59.46%	22
TOTAL		37

Comments (4)

Your property is located in which jurisdiction?

Answered: 36 Skipped: 7



Appendix C Business Survey



The following statistics were compiled for each of the questions on the Business Survey:

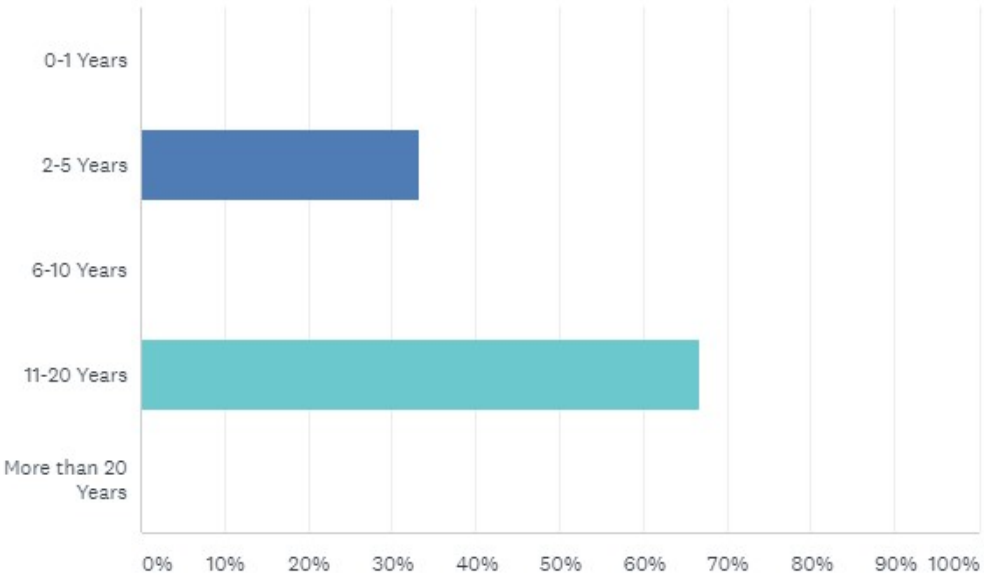


Q1

Customize Export

How long have you been in business at your current location?

Answered: 3 Skipped: 0



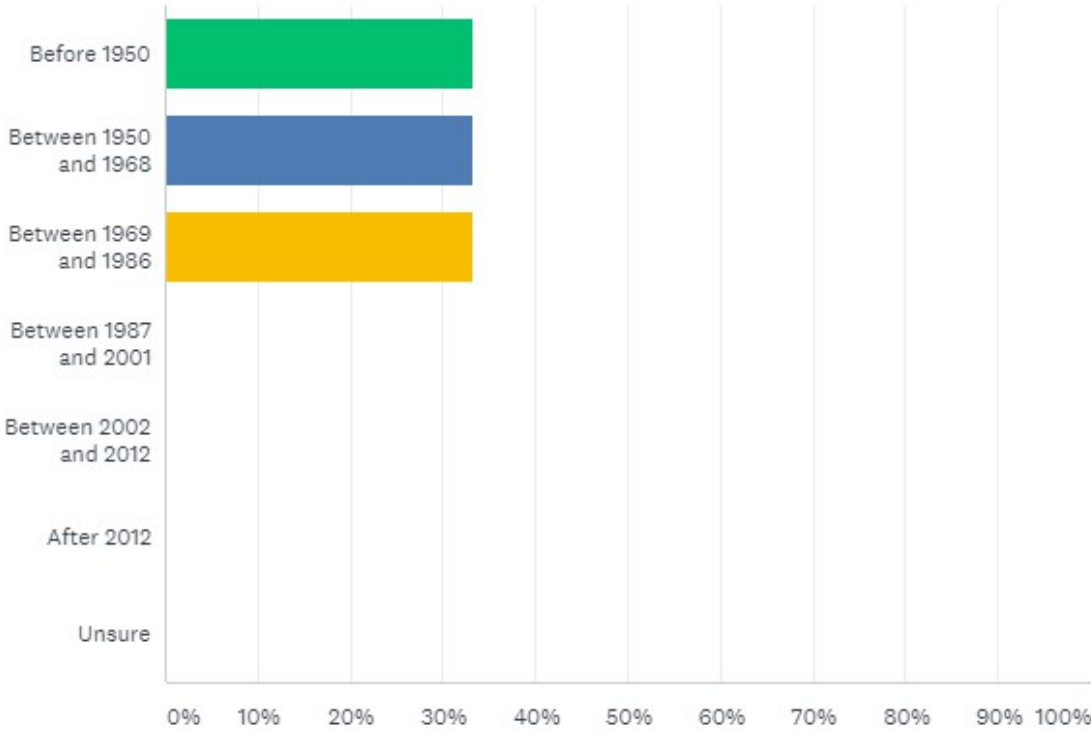
ANSWER CHOICES	RESPONSES
0-1 Years	0.00% 0
2-5 Years	33.33% 1
6-10 Years	0.00% 0
11-20 Years	66.67% 2
More than 20 Years	0.00% 0
TOTAL	3

Q2

Customize Export ▼

In what year was your building constructed?

Answered: 3 Skipped: 0

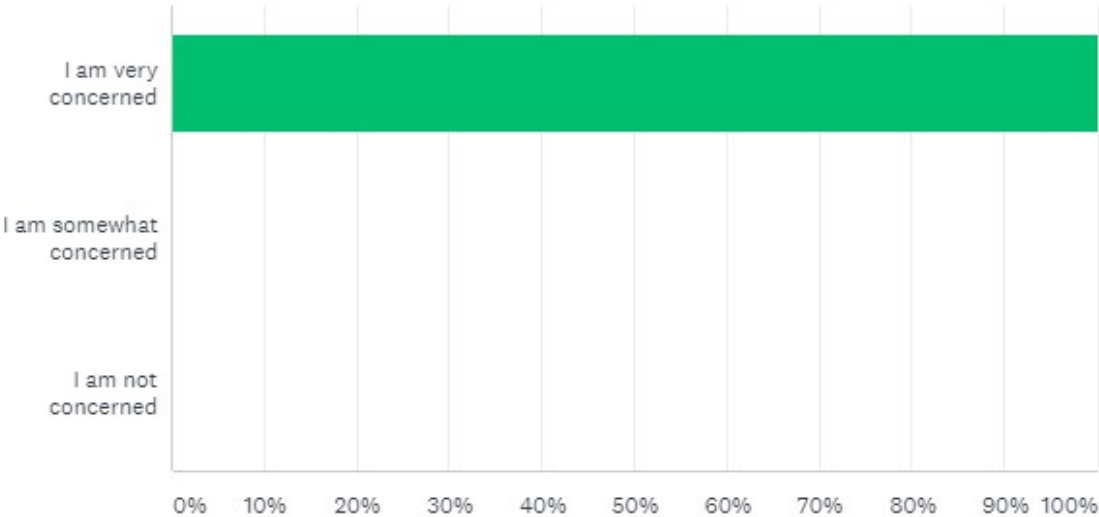


Q3

Customize Export

How concerned are you about the possibility of your place of business being flooded?

Answered: 3 Skipped: 0



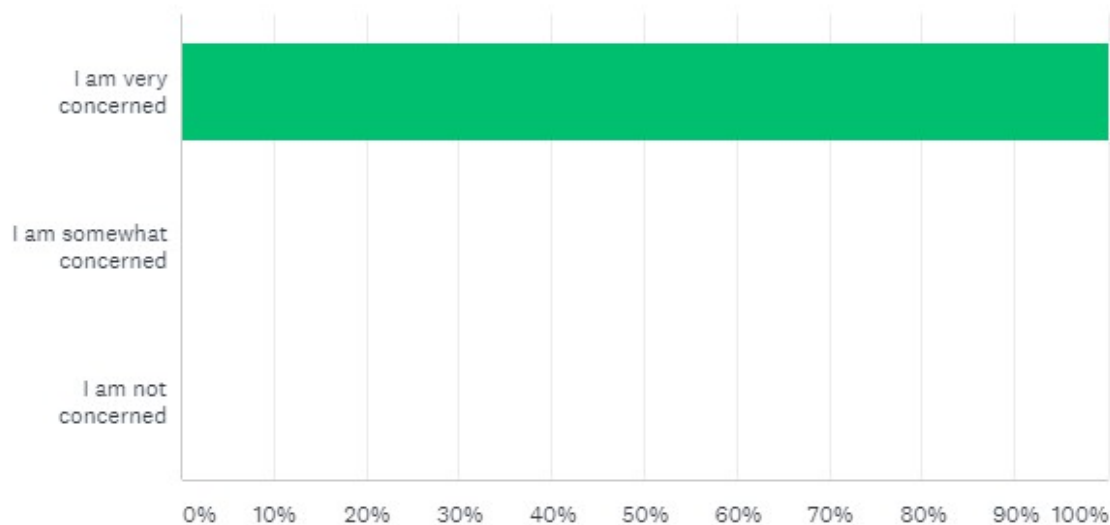
ANSWER CHOICES	RESPONSES	
I am very concerned	100.00%	3
I am somewhat concerned	0.00%	0
I am not concerned	0.00%	0
TOTAL		3

Q4

Customize Export

How concerned are you about the possibility of the streets accessing your place of business being flooded?

Answered: 3 Skipped: 0



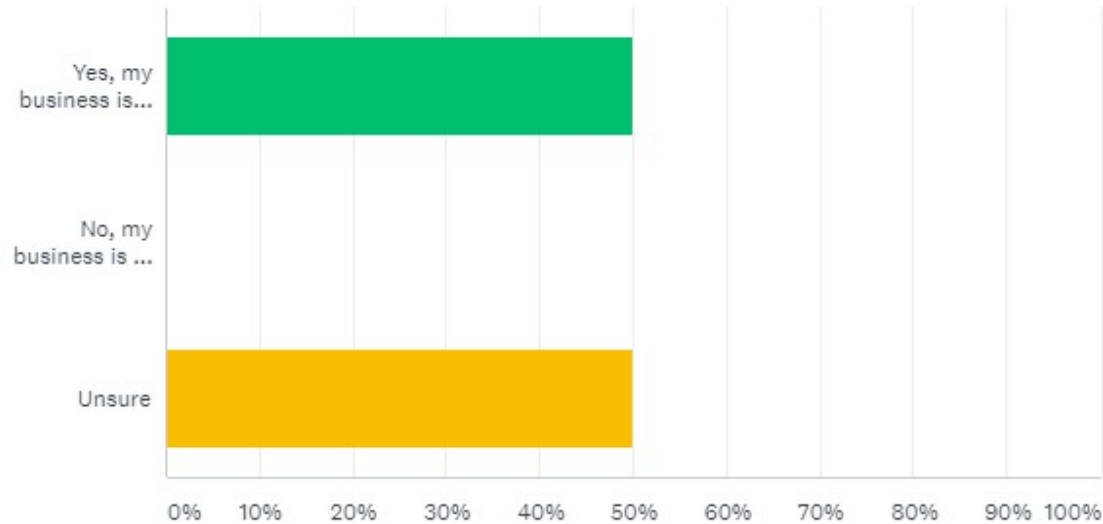
ANSWER CHOICES	RESPONSES	
I am very concerned	100.00%	3
I am somewhat concerned	0.00%	0
I am not concerned	0.00%	0
TOTAL		3

Q5

Customize Export

Is your business located within a designated flood hazard zone (floodplain)?

Answered: 2 Skipped: 1



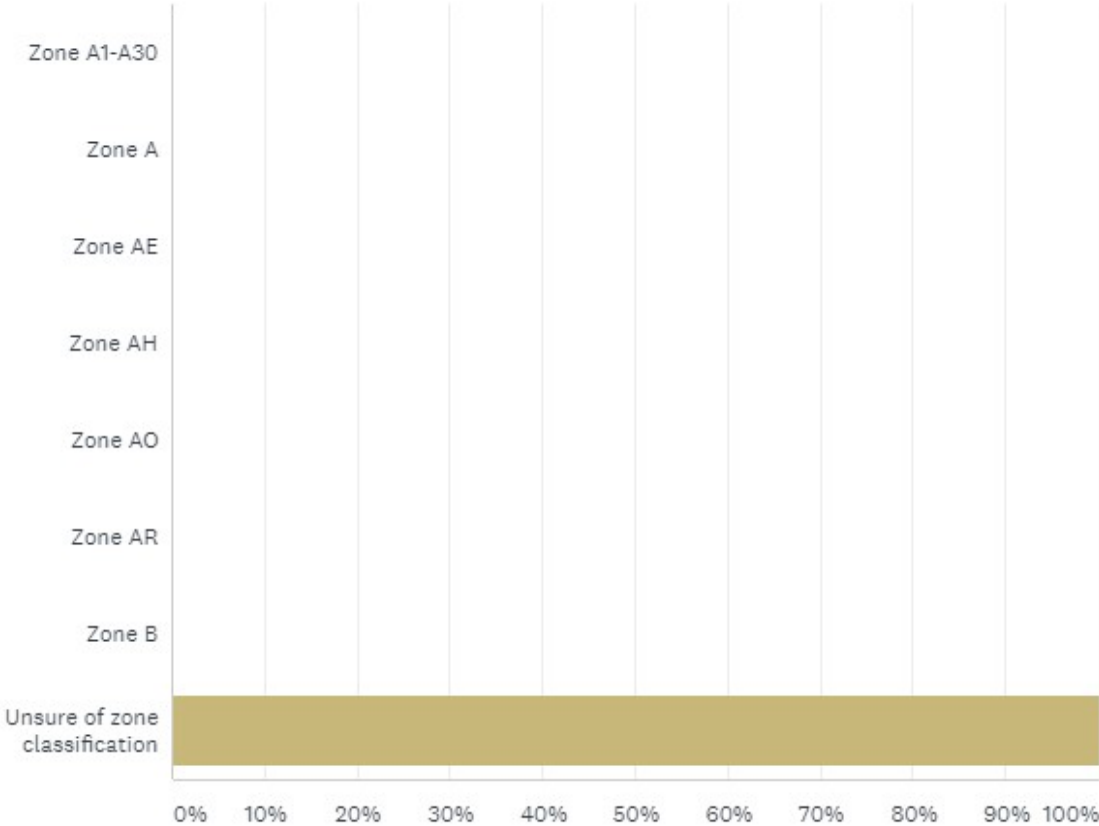
ANSWER CHOICES	RESPONSES	
Yes, my business is located within a designated flood hazard zone	50.00%	1
No, my business is not located within a designated flood hazard zone	0.00%	0
Unsure	50.00%	1
TOTAL		2

Q6

Customize Export ▼

Which flood zone is your property located in?

Answered: 1 Skipped: 2

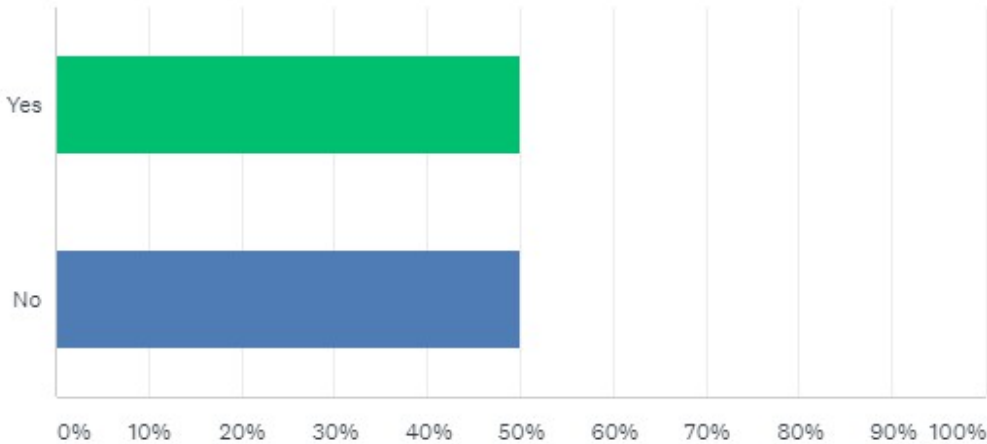


Q7

Customize Export

Was being located in a flood zone a concern in locating your business at its current location?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	50.00%	1
No	50.00%	1
TOTAL		2

Comments (1)

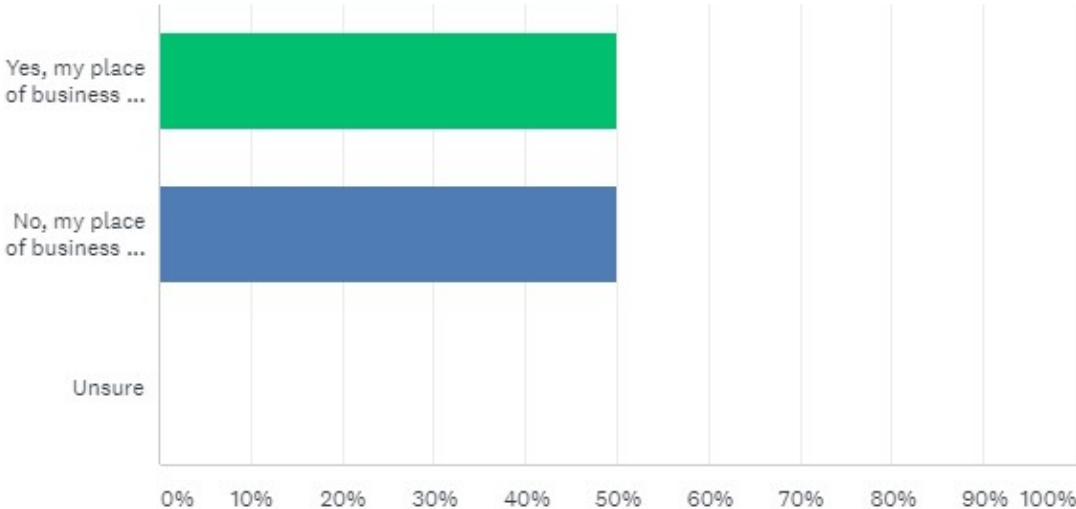


Q8

Customize Export

Has your place of business ever flooded due to natural/environmental causes?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes, my place of business has flooded due to natural/environmental causes.	50.00%	1
No, my place of business has never flooded due to natural/environmental causes.	50.00%	1
Unsure	0.00%	0
TOTAL		2

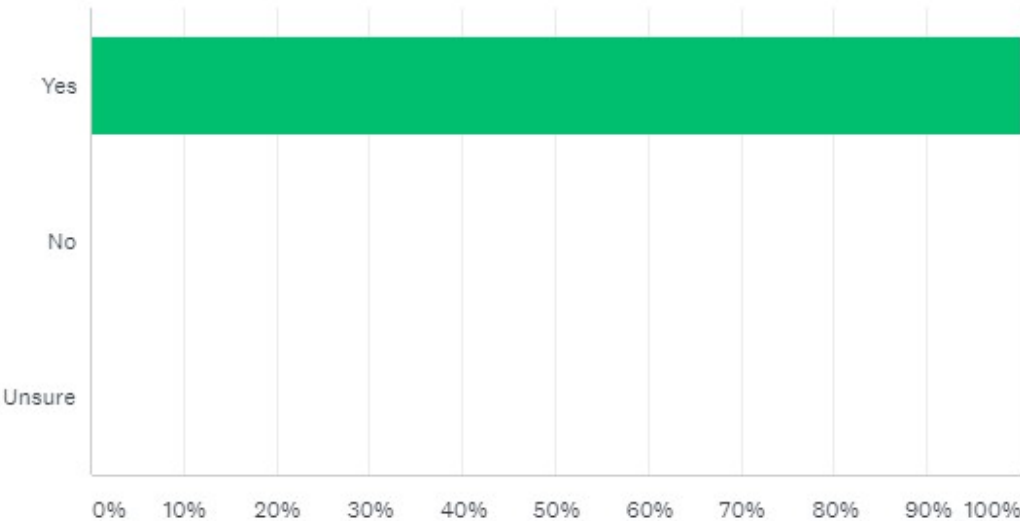
Comments (0)

Q9

Customize Export

Have you seen an increase in the frequency or duration of these flood events?

Answered: 2 Skipped: 1



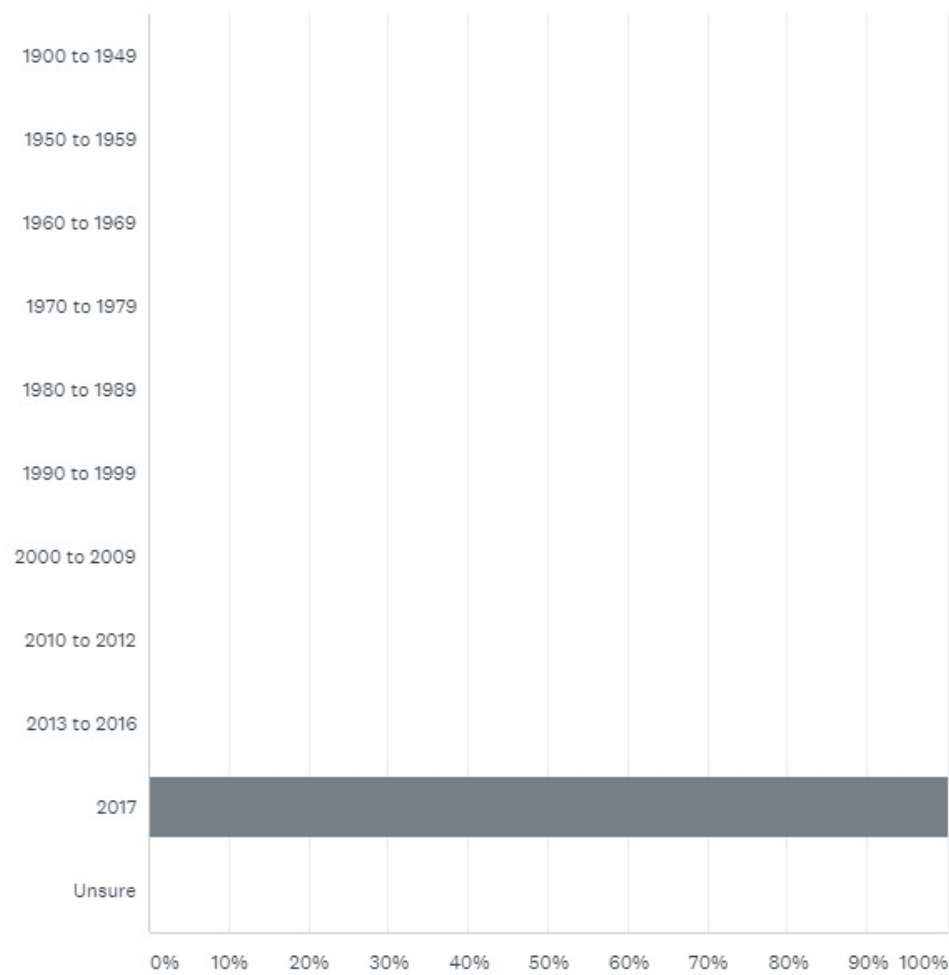
ANSWER CHOICES	RESPONSES	
Yes	100.00%	2
No	0.00%	0
Unsure	0.00%	0
TOTAL		2

Q10

Customize Export ▼

To your best knowledge, during which time period did your place of business last flood? (Check all that apply)

Answered: 1 Skipped: 2



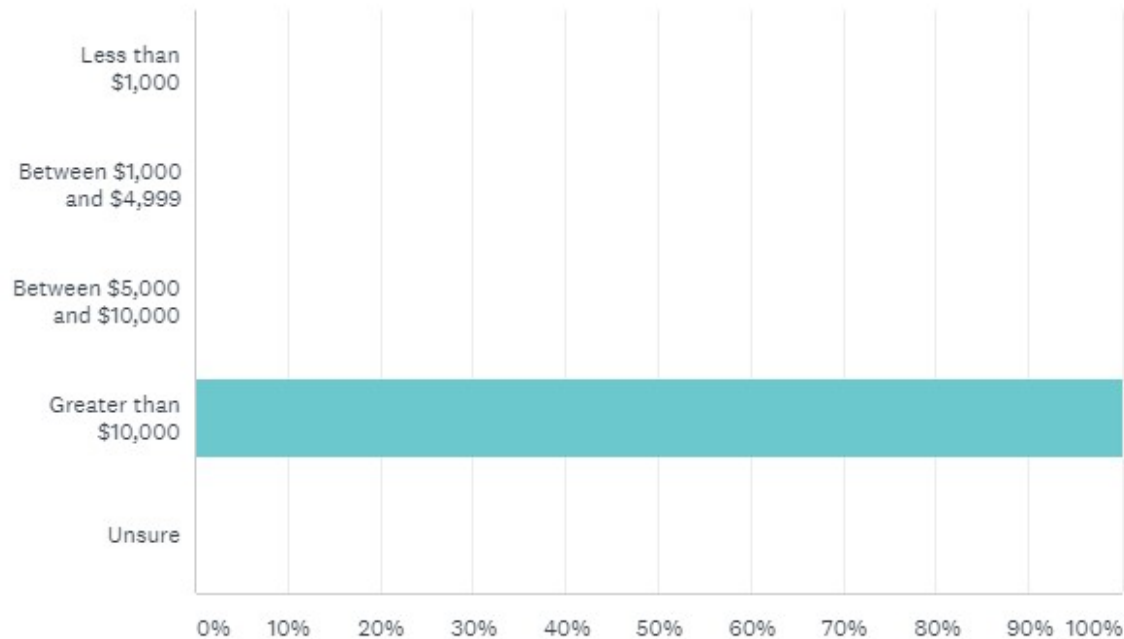
Q11

Customize

Export ▼

What was the approximate dollar value of all damages and losses to your business during the last flooding event?

Answered: 1 Skipped: 2



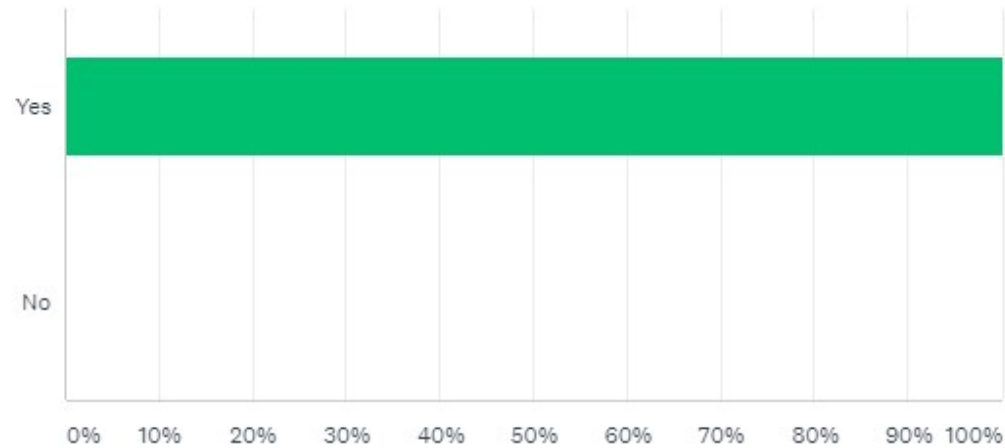
Q12

Customize

Export ▼

Has roadway flooding ever impacted access to your business?

Answered: 1 Skipped: 2



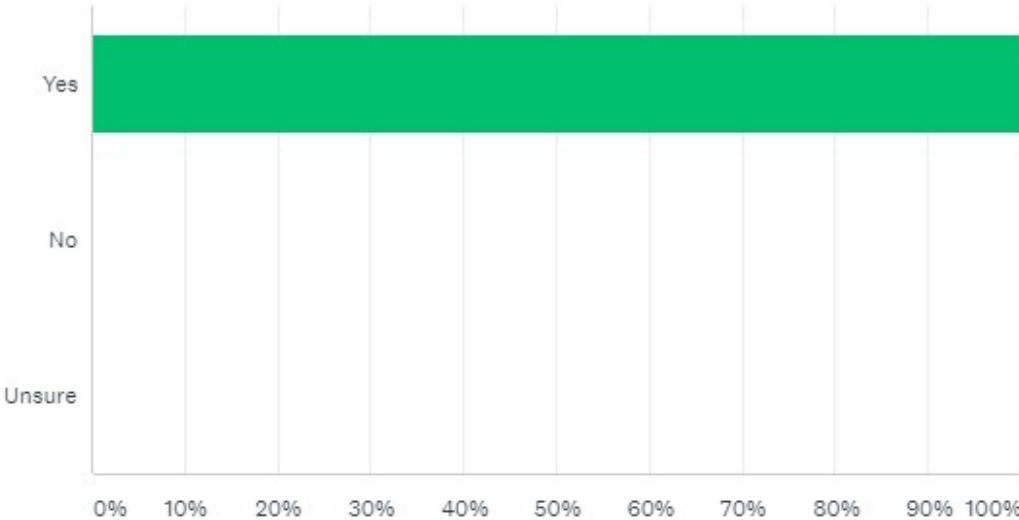
Q13

Customize

Export ▼

Have you seen an increase in the frequency or duration of these flood events?

Answered: 1 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	100.00%	1
No	0.00%	0
Unsure	0.00%	0
TOTAL		1

Q14

Export ▼

Describe, if any, the economic effect local flooding has on your business (ie, loss of business days, employees unable to work, profit loss, etc.)?

Answered: 2 Skipped: 1

RESPONSES (2)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



Showing 2 responses



We have property damage from the flooded street water being forced onto our property.

6/15/2018 8:59 AM

[View respondent's answers](#)
[Add Tags ▼](#)


I have been relocated, 60 miles round trip a day, no reimbursement from the county for gas or time.

6/13/2018 4:43 PM

[View respondent's answers](#)
[Add Tags ▼](#)

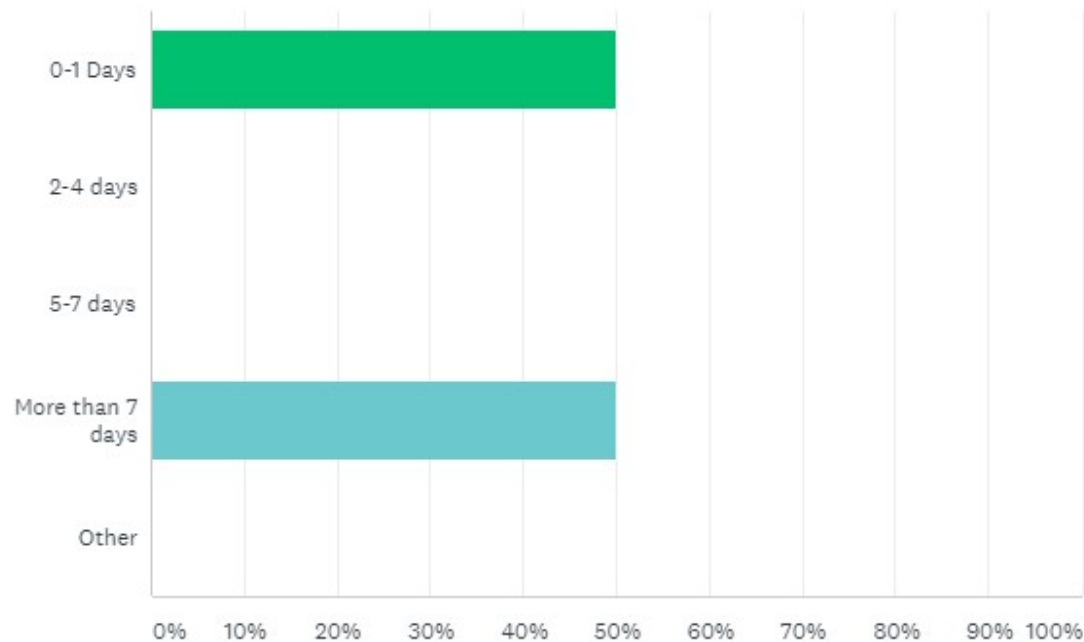

Q15

Customize

Export ▼

Approximately how many days of business, per year, do you lose due to flooding in your area?

Answered: 2 Skipped: 1

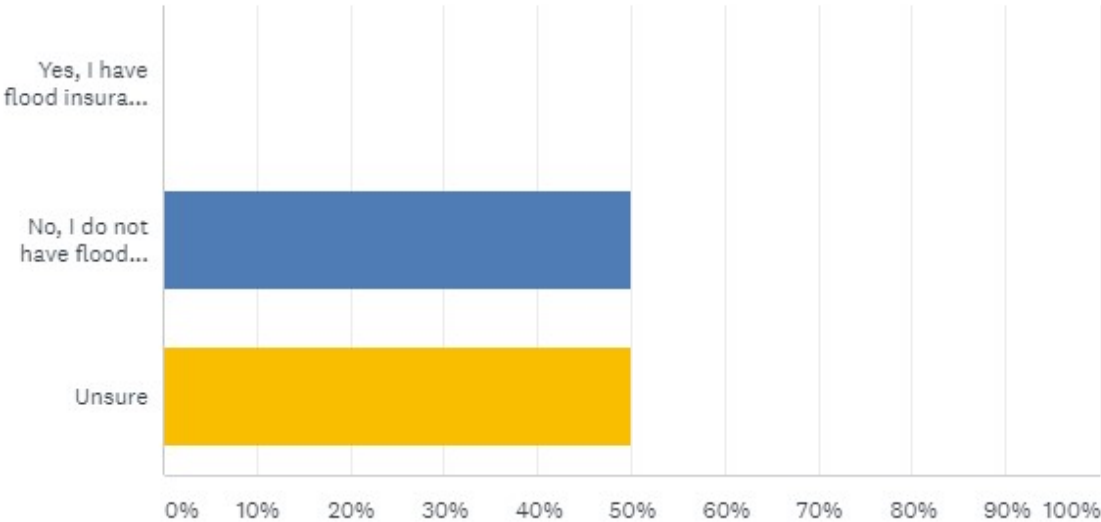


Q16

Customize Export

Do you currently have flood insurance for your property?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes, I have flood insurance for my property	0.00%	0
No, I do not have flood insurance for my property	50.00%	1
Unsure	50.00%	1
TOTAL		2

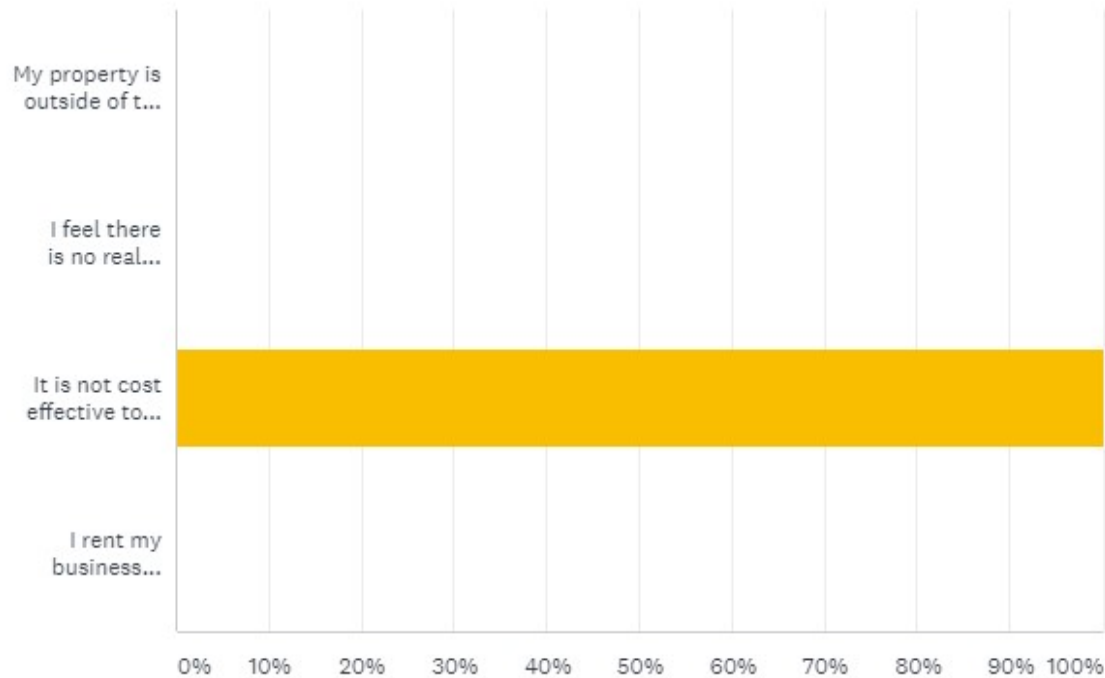
Q17

Customize

Export ▼

Which of the following reasons best describes why you do not have flood insurance?

Answered: 1 Skipped: 2

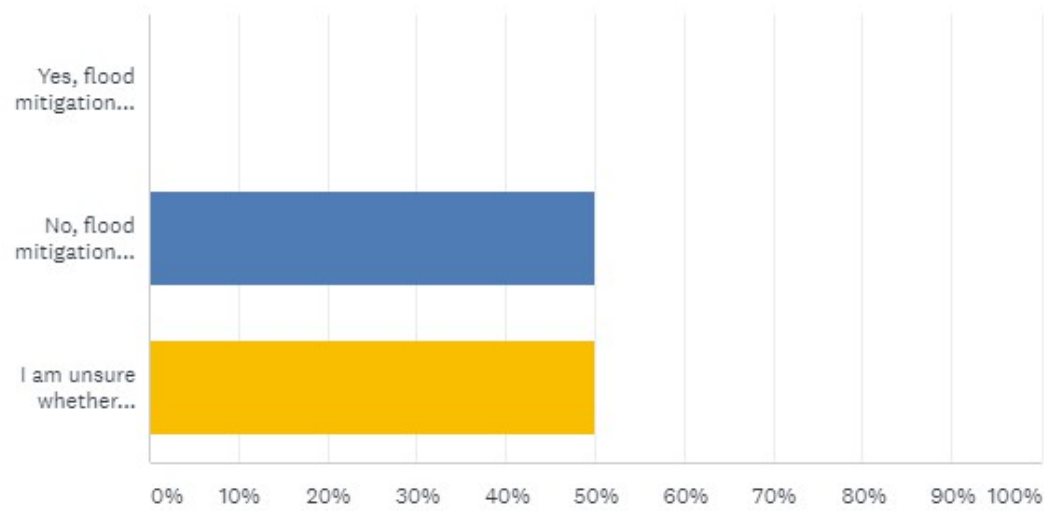


Q18

Customize Export

Have any flood mitigation efforts been implemented to your property?
(IE.steps taken to remedy or improve structural vulnerability to flooding or
flood proofing your property)

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes, flood mitigation efforts have been implemented on my property.	0.00%	0
No, flood mitigation efforts have not been implemented on my property.	50.00%	1
I am unsure whether mitigation efforts have been implemented on my property.	50.00%	1
TOTAL		2

Q19

Export ▼

Describe the mitigation efforts conducted on your property.

Answered: 0 Skipped: 3

RESPONSES (0)

TEXT ANALYSIS

TAGS (0)

☐

Add Tags ▼

Filter by Tag ▼



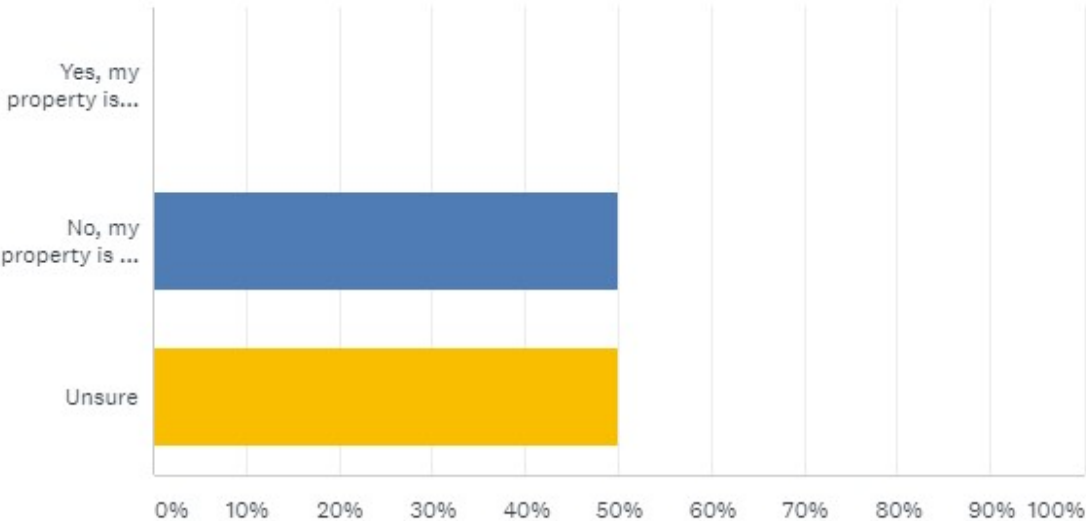
Showing 0 responses

Q20

Customize Export ▼

Is your property classified as a repetitive flood loss property?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES	
▼ Yes, my property is classified as a repetitive flood loss property	0.00%	0
▼ No, my property is not classified as a repetitive flood loss property	50.00%	1
▼ Unsure	50.00%	1
TOTAL		2

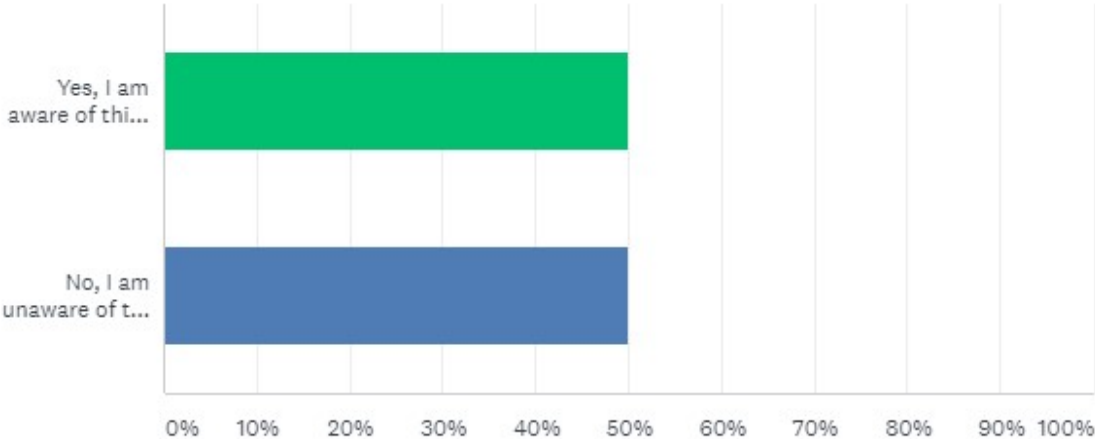
Q21

Customize

Export ▼

Did you know that you can view the current flood plain and other County-wide resources at the following web site:
[http://www.volusia.org/services/public-protection/emergency-management/ ?](http://www.volusia.org/services/public-protection/emergency-management/)

Answered: 2 Skipped: 1



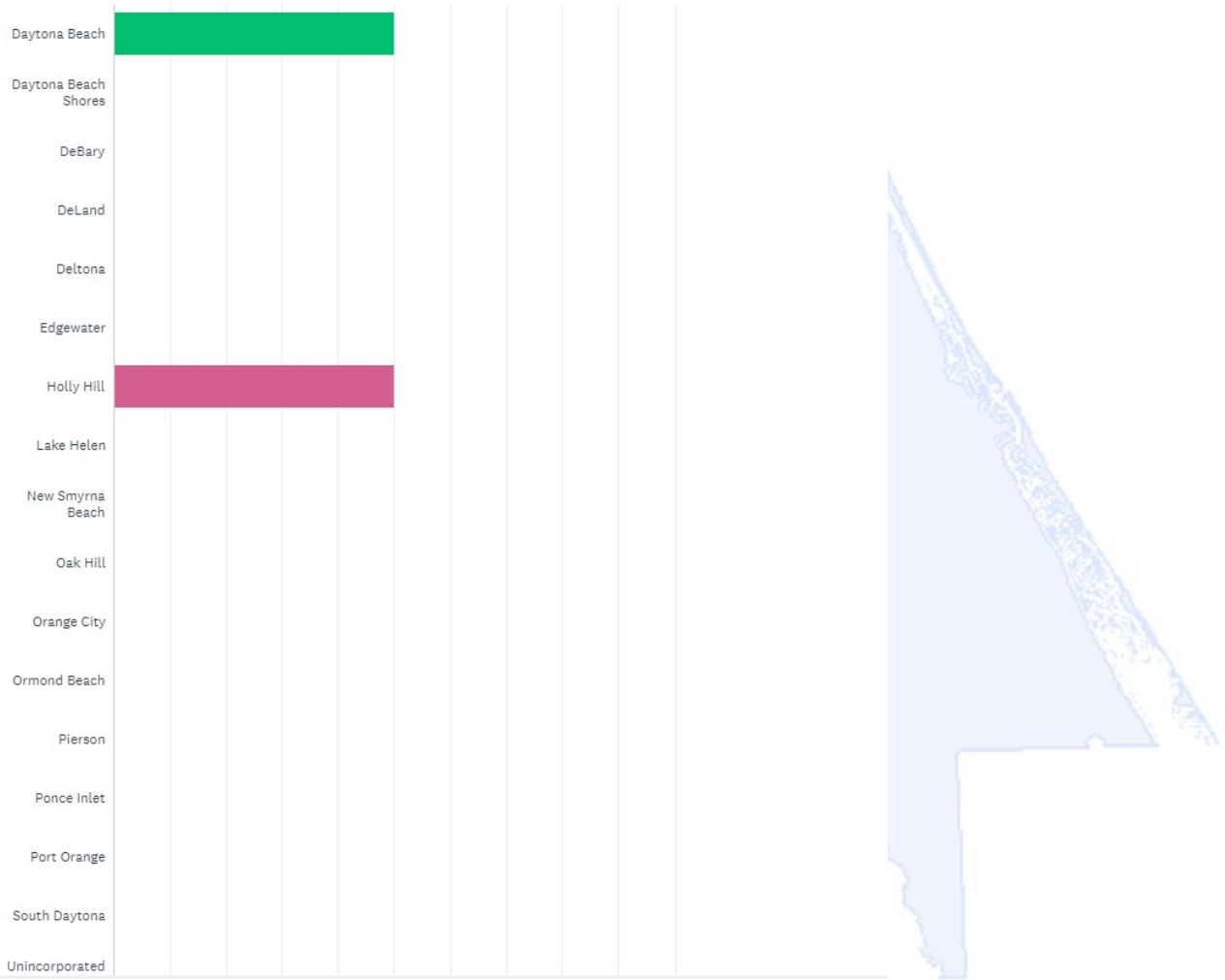
ANSWER CHOICES	RESPONSES	
▼ Yes, I am aware of this web site	50.00%	1
▼ No, I am unaware of this web site	50.00%	1
TOTAL		2

Q22

Your property is located in which jurisdiction?

Answered: 2 Skipped: 1

Customize Export ▼

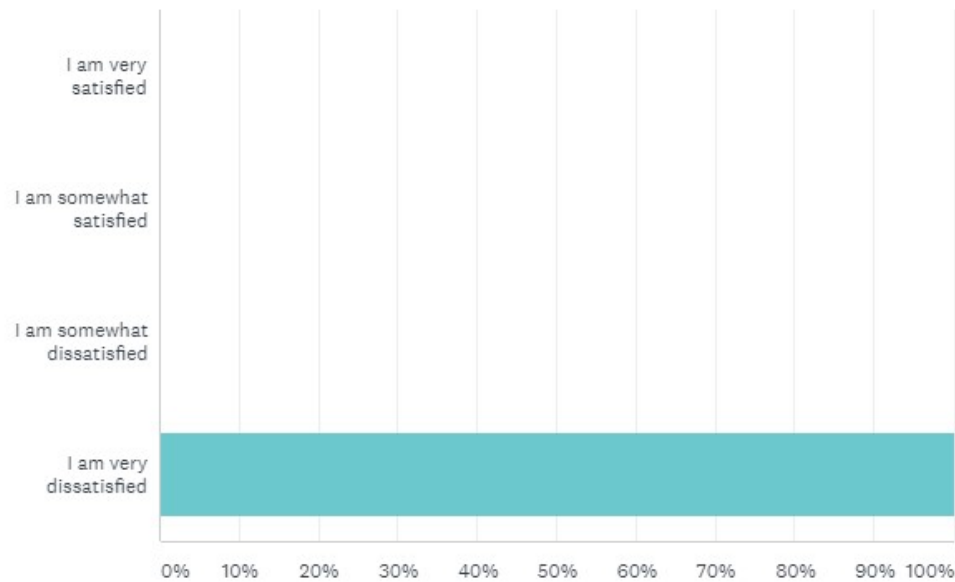


Q23

Customize Export

How satisfied are you with how your jurisdiction handles public involvement and outreach concerning flood hazards in your area?

Answered: 2 Skipped: 1



ANSWER CHOICES	RESPONSES
I am very satisfied	0.00% 0
I am somewhat satisfied	0.00% 0
I am somewhat dissatisfied	0.00% 0
I am very dissatisfied	100.00% 2
TOTAL	2

Appendix D

Neighborhood Association Survey



The following statistics were compiled for each of the questions on the Neighborhood Association Survey:

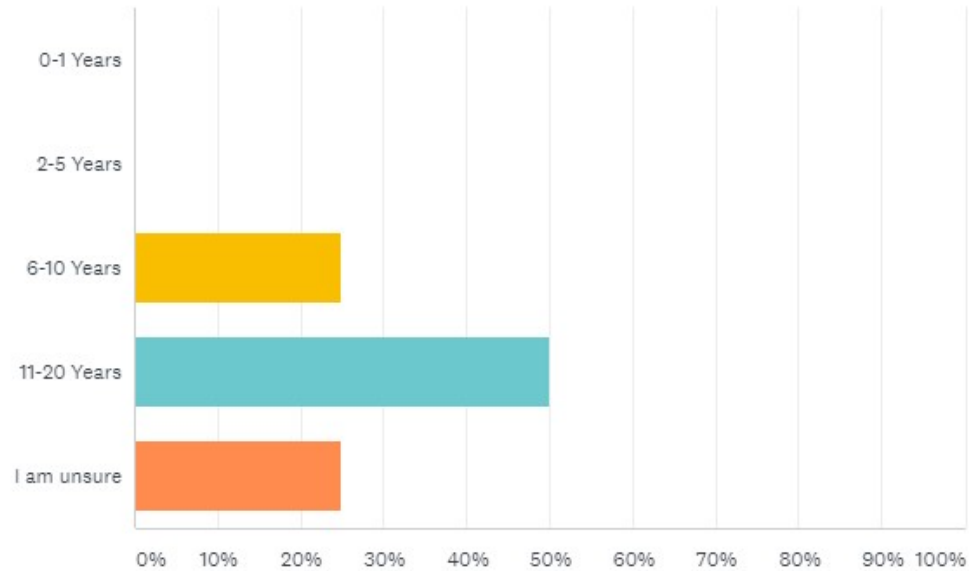


Q1

Customize Export

How long has your neighborhood association been active?

Answered: 4 Skipped: 0



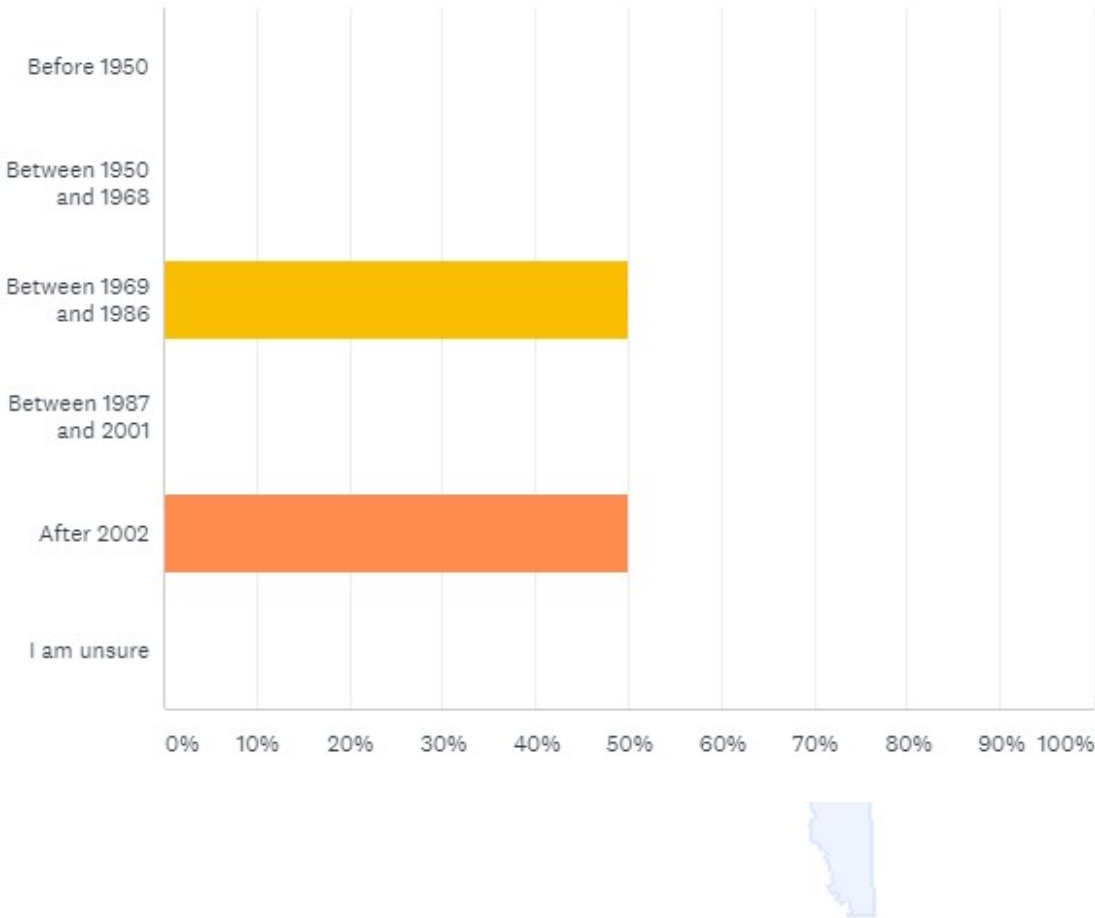
ANSWER CHOICES	RESPONSES	
0-1 Years	0.00%	0
2-5 Years	0.00%	0
6-10 Years	25.00%	1
11-20 Years	50.00%	2
I am unsure	25.00%	1
TOTAL		4

Q2

Customize Export ▼

In what year were the homes in your coverage area built?

Answered: 4 Skipped: 0

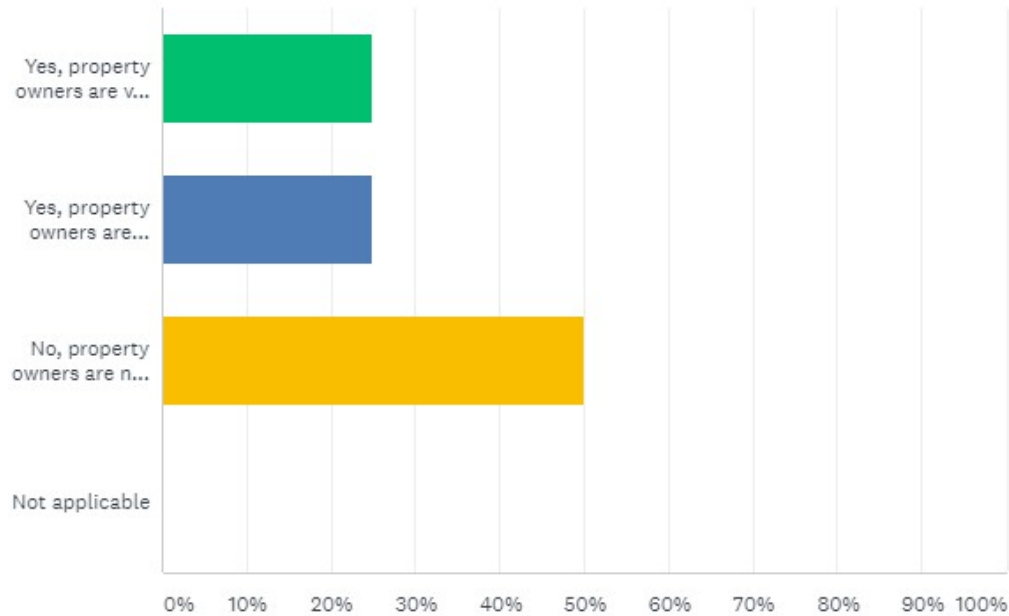


Q3

Customize Export

Is flooding a real concern for property owners in your association?

Answered: 4 Skipped: 0



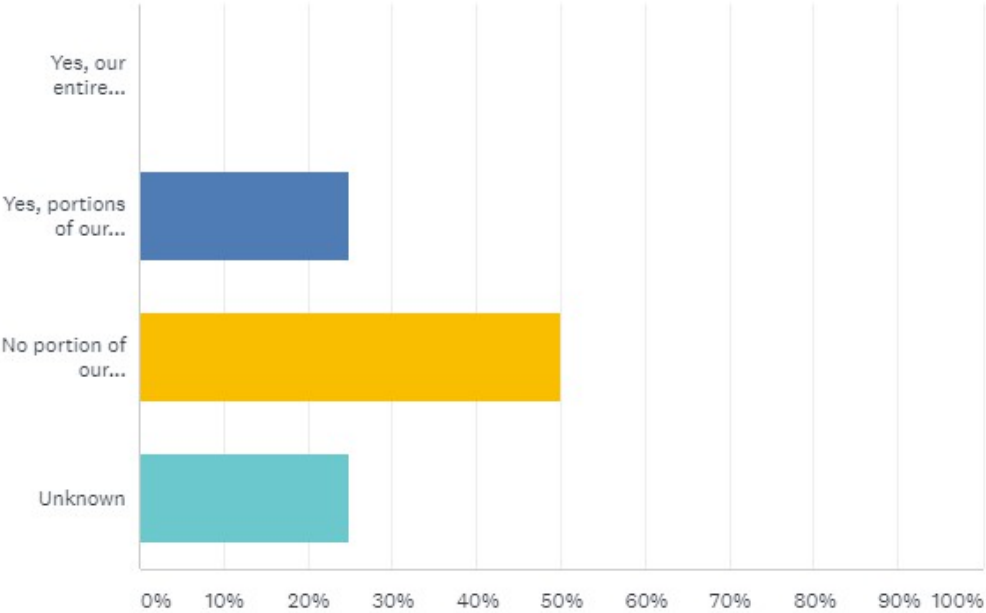
ANSWER CHOICES	RESPONSES	
Yes, property owners are very concerned about flooding	25.00%	1
Yes, property owners are somewhat concerned about flooding	25.00%	1
No, property owners are not concerned about flooding	50.00%	2
Not applicable	0.00%	0
TOTAL		4

Q4

Customize Export

Is your Homeowner’s Association neighborhood located in the flood plain?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, our entire neighborhood is located in the flood plain	0.00%	0
Yes, portions of our neighborhood are located in the floodplain	25.00%	1
No portion of our neighborhood is located in the floodplain	50.00%	2
Unknown	25.00%	1
TOTAL		4

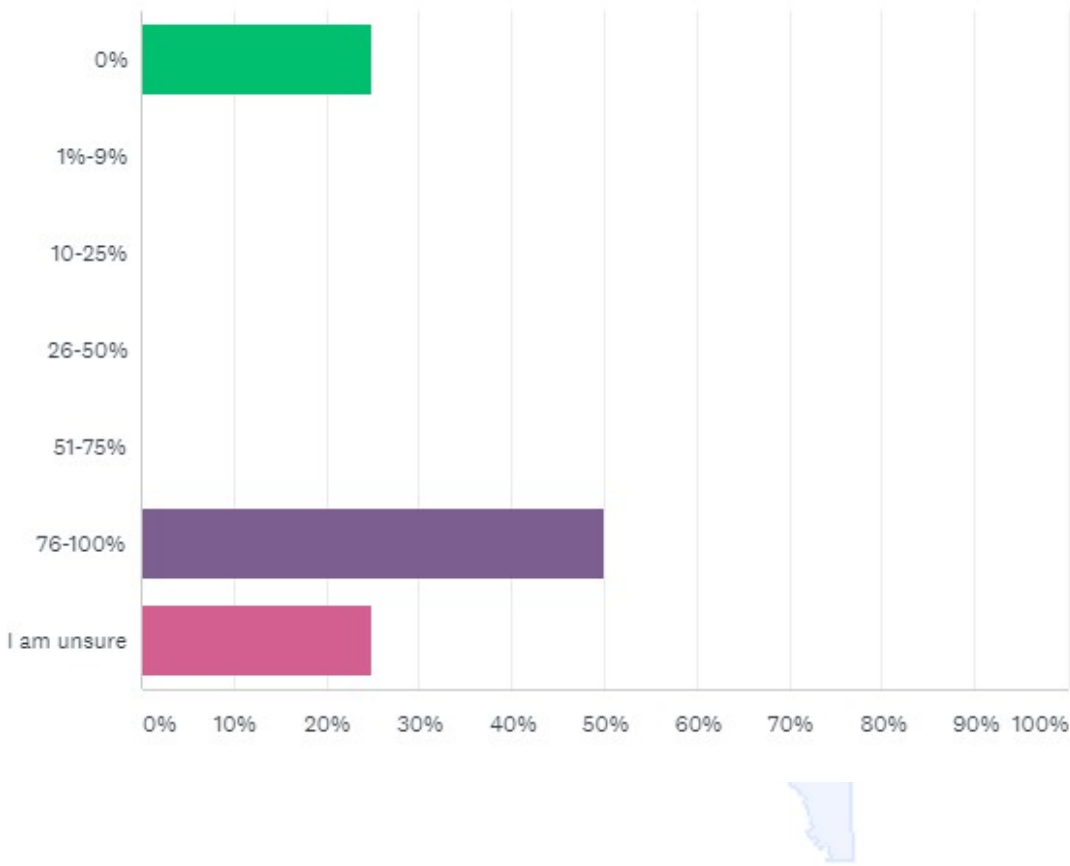
Q5

Customize

Export ▼

Approximately what percentage of the homes within your association are within a designated flood hazard zone?

Answered: 4 Skipped: 0

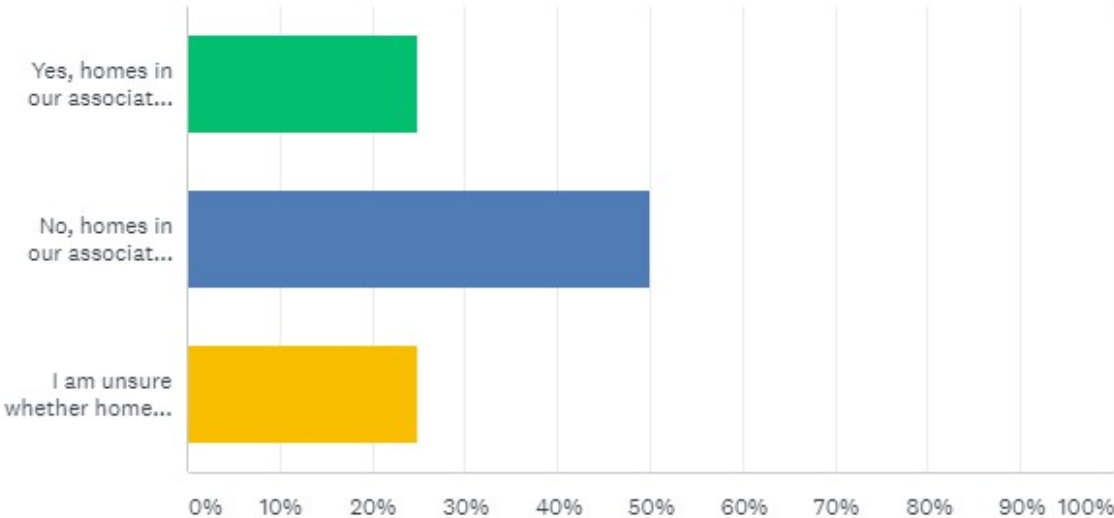


Q6

Customize Export

Have homes in your association area ever been flooded due to natural environmental causes?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, homes in our association area have flooded.	25.00%	1
No, homes in our association area have never flooded.	50.00%	2
I am unsure whether homes in our association have flooded.	25.00%	1
TOTAL		4

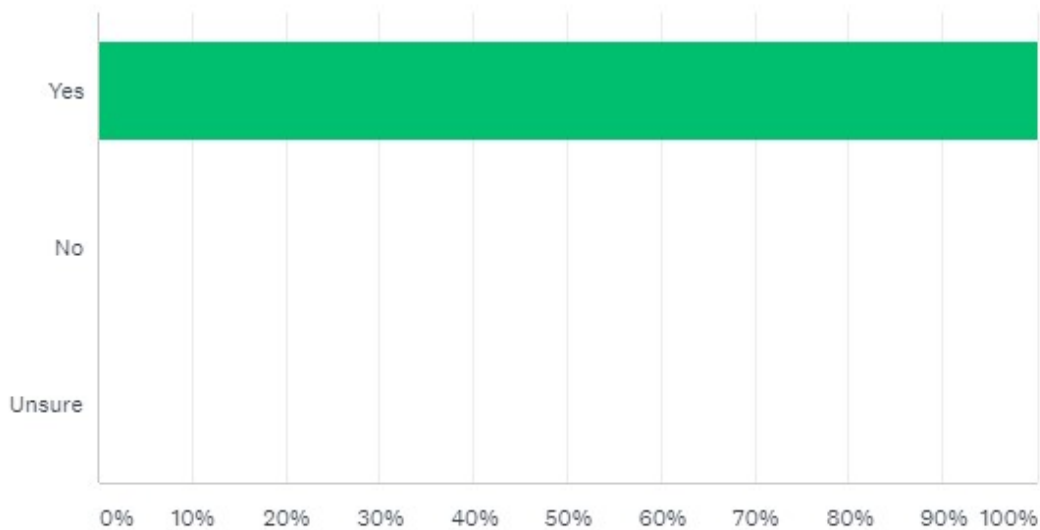
Comments (0)

Q7

Customize Export

If you answered yes to the previous question, has there been an increase in the frequency and duration of these flood events?

Answered: 2 Skipped: 2



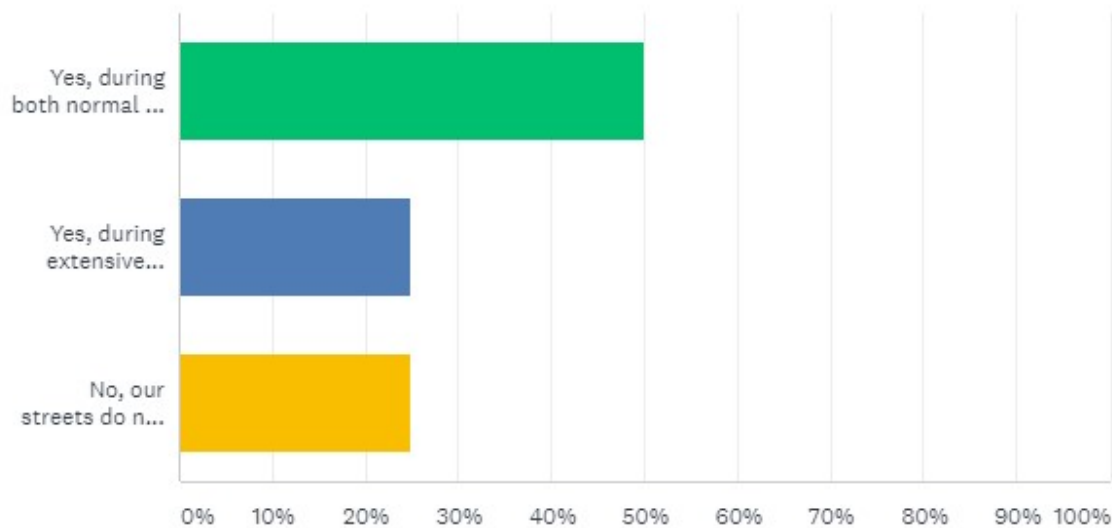
ANSWER CHOICES	RESPONSES	
Yes	100.00%	2
No	0.00%	0
Unsure	0.00%	0
TOTAL		2

Q8

Customize Export

Do the roadways in your neighborhood experience major flooding during normal or extensive rainfall?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, during both normal and extensive	50.00%	2
Yes, during extensive rainfall only	25.00%	1
No, our streets do not normally flood	25.00%	1
TOTAL		4

Comments (0)

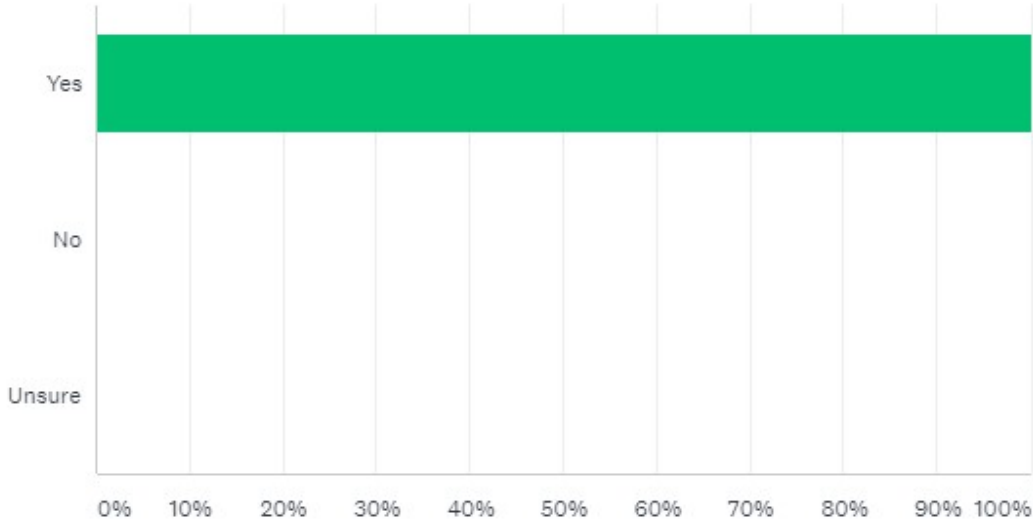
Q9

Customize

Export ▼

If you answered yes to the previous question, has there been an increase in the frequency and duration of these flood events?

Answered: 2 Skipped: 2

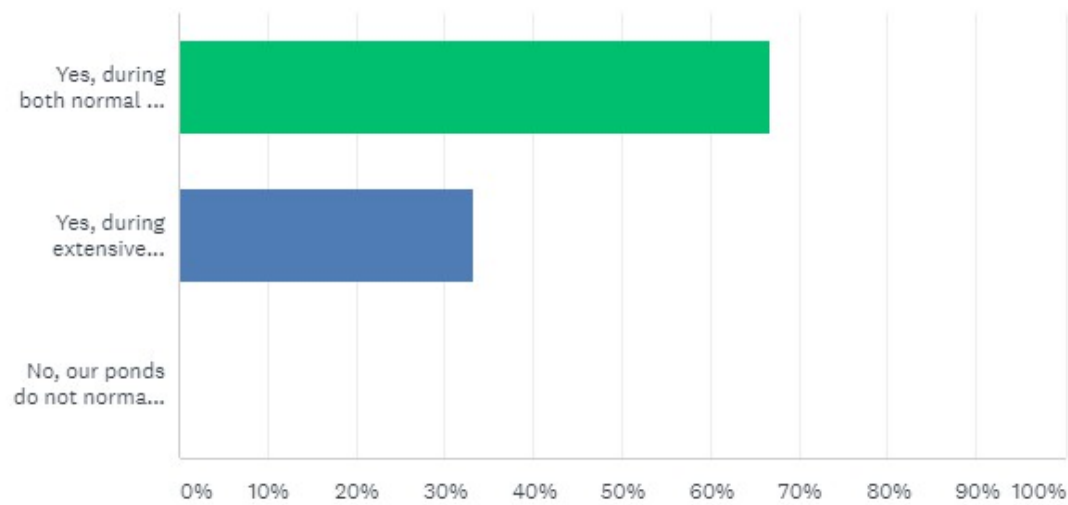


Q10

Customize Export

Do retention ponds in your neighborhood flood during normal or extensive rainfall?

Answered: 3 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes, during both normal and extensive	66.67%	2
Yes, during extensive rainfall only	33.33%	1
No, our ponds do not normally flood	0.00%	0
TOTAL		3

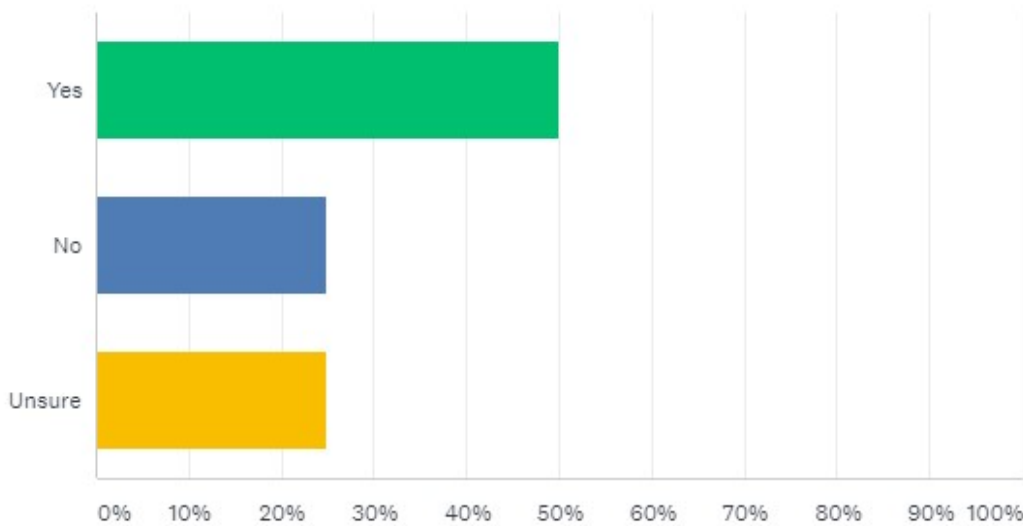
Comments (2)

Q11

Customize Export

If you answered yes to the previous questions, has there been an increase in the frequency and duration of these flood events?

Answered: 4 Skipped: 0



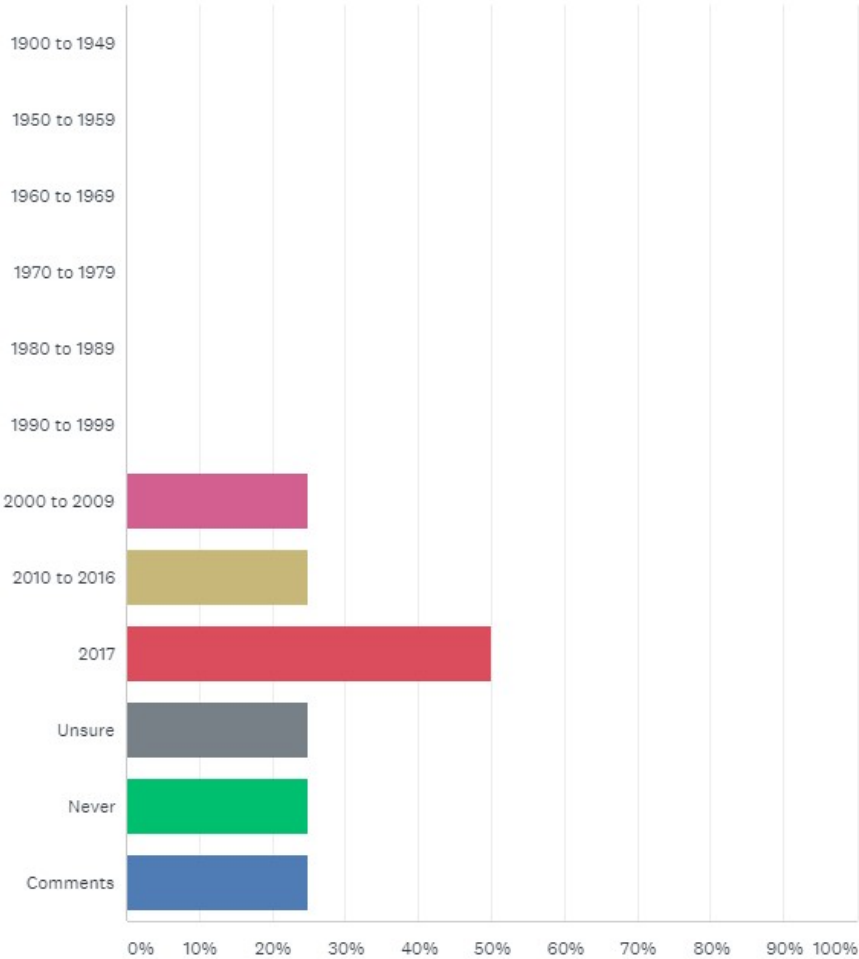
ANSWER CHOICES	RESPONSES	
Yes	50.00%	2
No	25.00%	1
Unsure	25.00%	1
TOTAL		4

Q12

Customize Export

To the best of your knowledge, during which time period did a home in your association area last flood? (Check all that apply)

Answered: 4 Skipped: 0

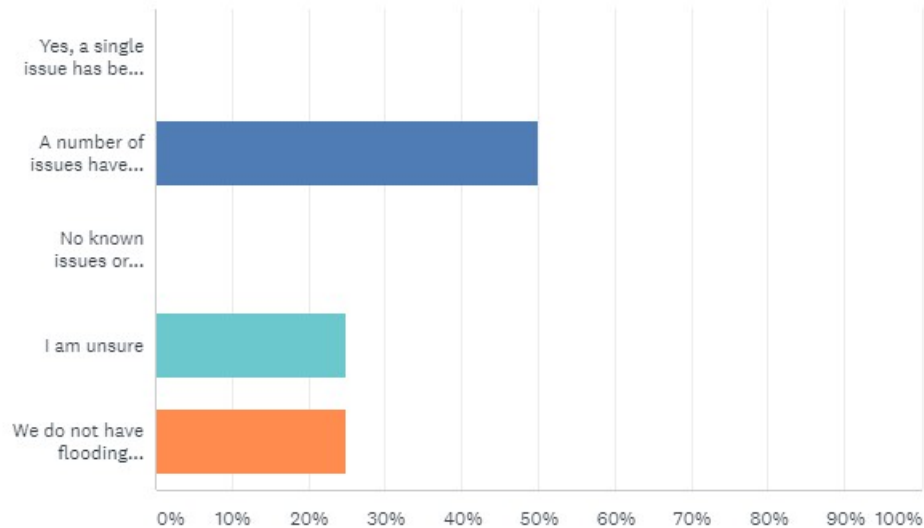


Q13

Customize Export

Has a known problem area been identified as the source of most flooding issues experienced by your neighborhood?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, a single issue has been identified as the main contributor to the flooding.	0.00%	0
A number of issues have been identified which contribute to the flooding.	50.00%	2
No known issues or sources have been identified which contribute to the flooding.	0.00%	0
I am unsure	25.00%	1
We do not have flooding issues.	25.00%	1
TOTAL		4

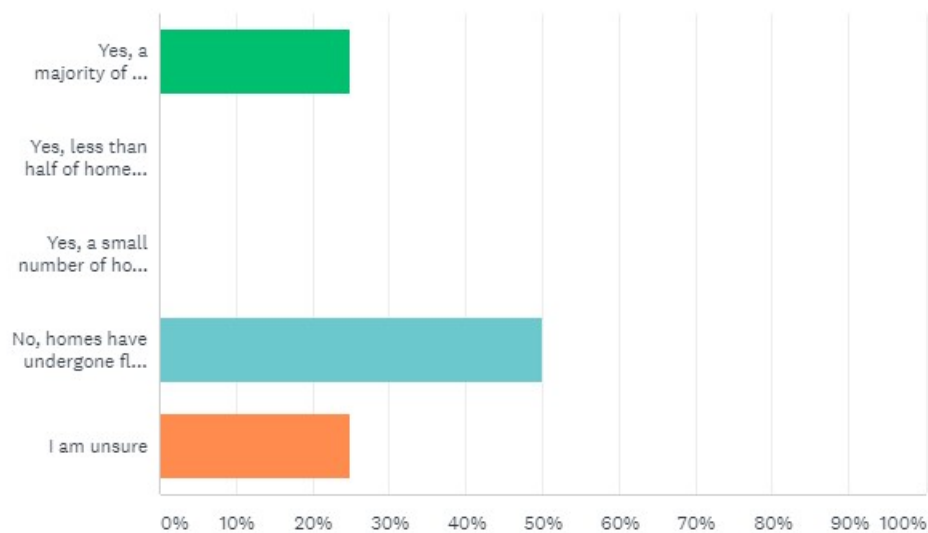
Comments (1)

Q14

Customize Export

Have homes in your association undergone flood mitigation efforts? (i.e. steps taken to remedy or improve structural vulnerability to flooding or flood proofing your home)

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, a majority of the homes have undergone flood mitigation efforts	25.00%	1
Yes, less than half of homes have undergone flood mitigation efforts	0.00%	0
Yes, a small number of homes have undergone flood mitigation efforts	0.00%	0
No, homes have undergone flood mitigation efforts	50.00%	2
I am unsure	25.00%	1
TOTAL		4

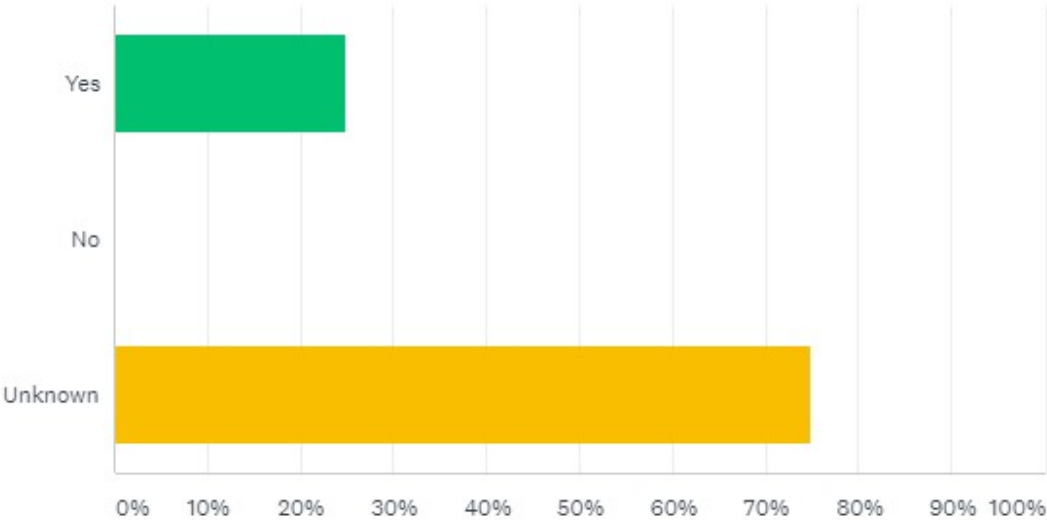
Q15

Customize

Export ▼

Are there any restrictions to structural improvements that, if removed, could possibly reduce the risk of flood loss to properties in your area?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
▼ Yes	25.00%	1
▼ No	0.00%	0
▼ Unknown	75.00%	3
TOTAL		4

Q16

Export ▼

If you answered "Yes" to the previous question, please explain these types of restrictions.

Answered: 1 Skipped: 3

RESPONSES (1) TEXT ANALYSIS TAGS (0)

☐ Add Tags ▼ Filter by Tag ▼

Search responses  

Showing 1 response

☐ Re Sod and rental homes not properly maintained.

6/13/2018 9:22 PM

[View respondent's answers](#) [Add Tags ▼](#)

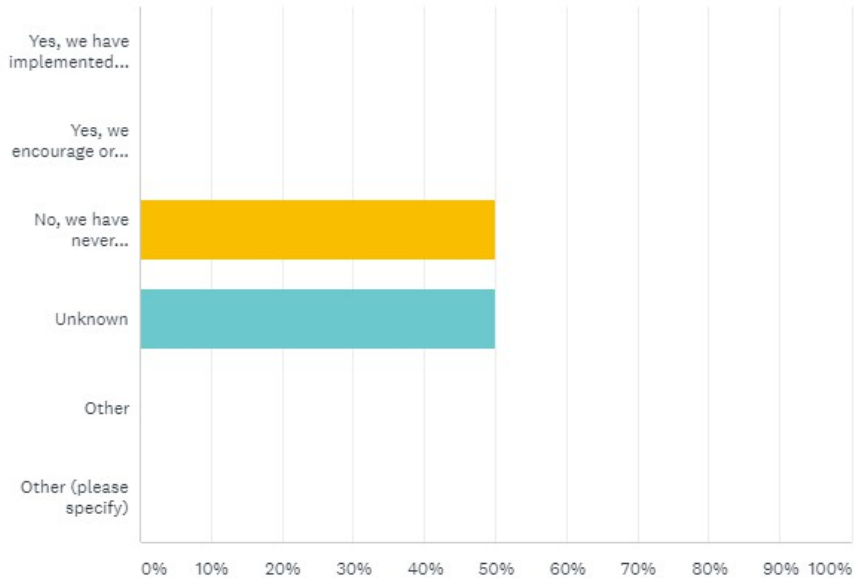


Q17

Customize Export

Has your association ever implemented large-scale flood mitigation efforts?
(Example: activities to alleviate flood impacts in the community)

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, we have implemented incentive programs	0.00%	0
Yes, we encourage or assist property owners with flood mitigation efforts	0.00%	0
No, we have never implemented large-scale flood mitigation efforts	50.00%	2
Unknown	50.00%	2
Other	0.00%	0
Other (please specify)	0.00%	0
TOTAL		4

Q18

Export ▼

If you answered ‘Yes’ to the above question, what types of improvements were made?

Answered: 0 Skipped: 4

RESPONSES (0)

TEXT ANALYSIS

TAGS (0)



Add Tags ▼

Filter by Tag ▼

Search responses



Showing 0 responses

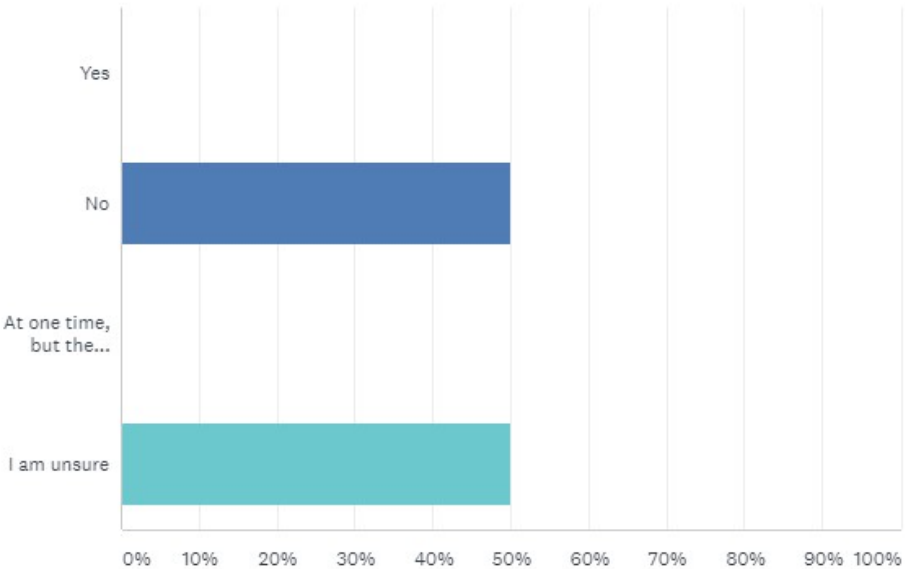


Q19

Customize Export

Are there homes in your association area that are classified as Repetitive Flood Loss properties (defined as a structure that has experienced two floods in the last ten years with at least \$1,000 in damages per event)?

Answered: 4 Skipped: 0



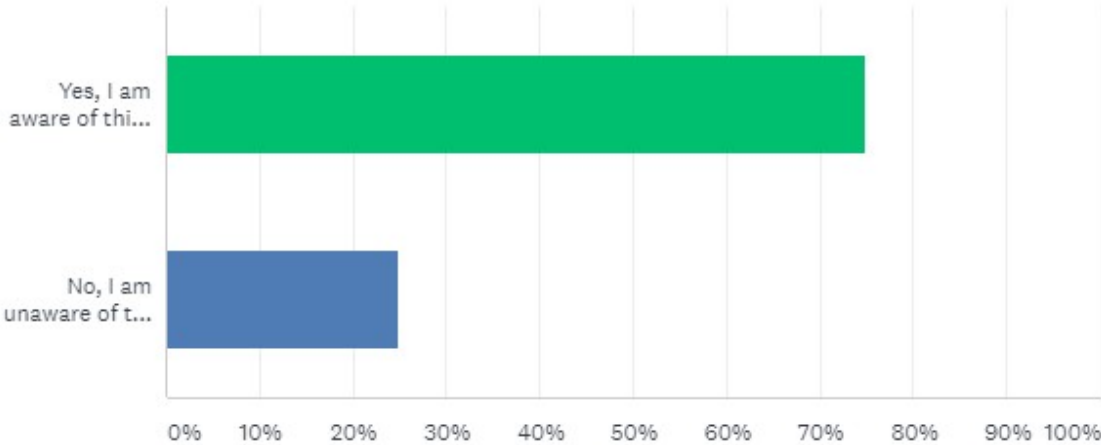
ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	50.00%	2
At one time, but the classification has been removed	0.00%	0
I am unsure	50.00%	2
TOTAL		4

Q20

Customize Export

Did you know that you can view the current flood plain and other County-wide resources at the following web site:
<http://www.volusia.org/services/public-protection/emergency-management>

Answered: 4 Skipped: 0



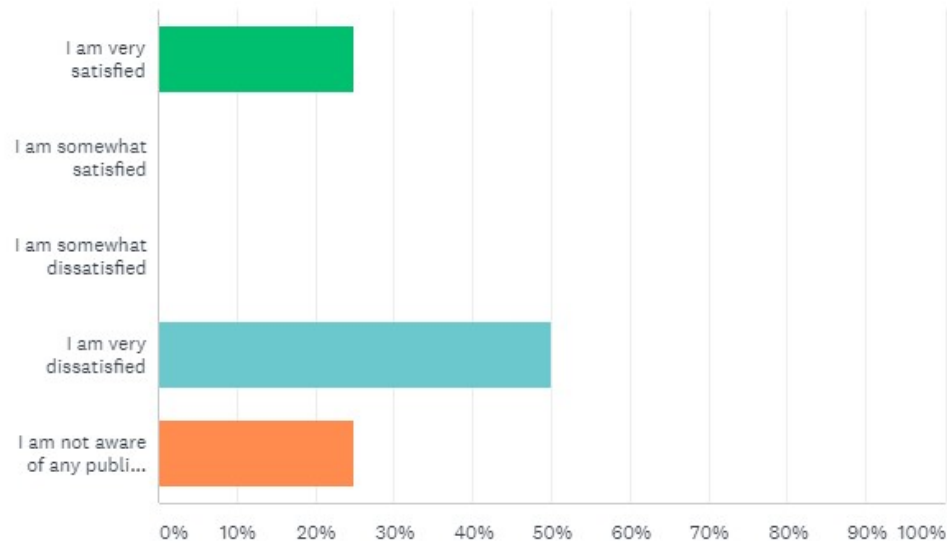
ANSWER CHOICES	RESPONSES	
Yes, I am aware of this web site.	75.00%	3
No, I am unaware of this web site.	25.00%	1
TOTAL		4

Q21

Customize Export

How satisfied are you with how your jurisdiction handles public involvement and outreach concerning flood hazards in your area?

Answered: 4 Skipped: 0



ANSWER CHOICES	RESPONSES	
I am very satisfied	25.00%	1
I am somewhat satisfied	0.00%	0
I am somewhat dissatisfied	0.00%	0
I am very dissatisfied	50.00%	2
I am not aware of any public involvement/outreach efforts concerning flood hazards	25.00%	1
TOTAL		4

Comments (1)

Q22

Export ▼

Enter the name of your Homeowner's Association.

Answered: 3 Skipped: 1

RESPONSES (3)

TEXT ANALYSIS

TAGS (0)

☐

Add Tags ▼

Filter by Tag ▼



Showing 3 responses

☐

Riviera Village Association, Inc.

6/15/2018 9:32 AM

[View respondent's answers](#)

[Add Tags ▼](#)

☐

Woodland Ridge HOA

6/14/2018 6:00 PM

[View respondent's answers](#)

[Add Tags ▼](#)

☐

Fairway Estates

6/13/2018 4:36 PM

[View respondent's answers](#)

[Add Tags ▼](#)

Q23

Export ▼

Enter Contact Information for your Homeowner's Association.

Answered: 2 Skipped: 2

ANSWER CHOICES ▼		RESPONSES ▼	
Name	Responses	100.00%	2
Company	Responses	0.00%	0
Address	Responses	0.00%	0
Address 2	Responses	0.00%	0
City/Town	Responses	0.00%	0
State/Province	Responses	0.00%	0
ZIP/Postal Code	Responses	0.00%	0
Country	Responses	0.00%	0
Email Address	Responses	0.00%	0
Phone Number	Responses	100.00%	2

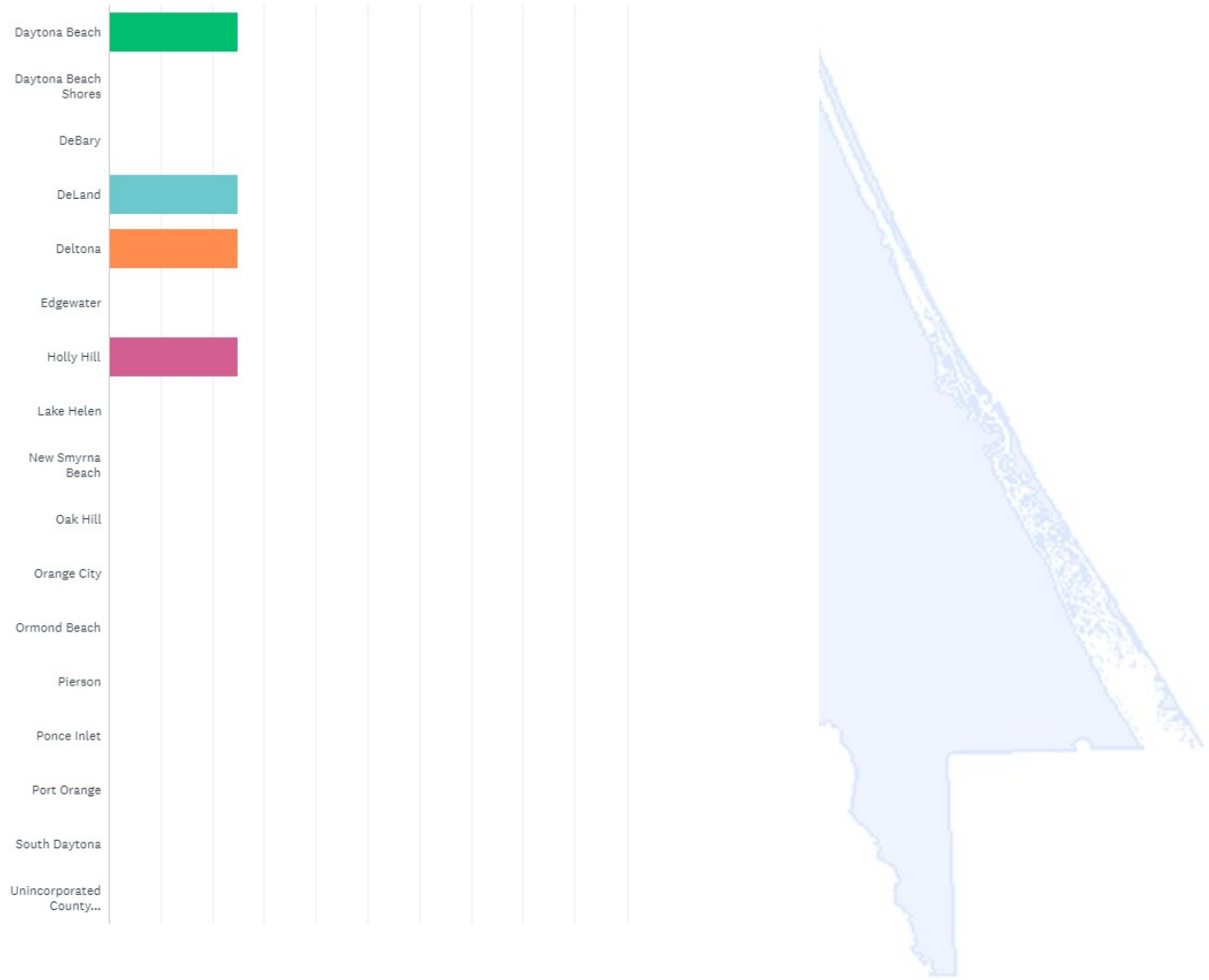


Q24

Customize Export

Your Homeowner's Association is located in what jurisdiction?

Answered: 4 Skipped: 0



Appendix E

Public Meeting Information



Overview

Public meetings were held on June 15th, 2018 in DeLand and June 18th, 2018 in Daytona Beach to gather feedback from the public and update the public on the progression of the plan. Two hard copies of the Draft Plan were provided at each meeting, and links to the plan (online) were distributed.

Meeting Format

The public meetings began with introductions of all persons in attendance, including residents and the project team. PJ Smith of the planning team then presented the plan via the PowerPoint included in this portion of the report. Following the presentation, hard copies of the plan were looked over by members of the public. Larry LaHue (VCEM), Aubrie Austin (VCEM), Michelle Cechowski (ECFRPC), Mark Reali (ECFRPC) and PJ Smith (ECFRPC) then answered questions from the public. The presentation portion of each meeting took approximately ten to fifteen minutes, while the discussions lasted for over one hour. Following the discussion, the project team stayed in the meeting location until the meeting window closed to ensure that all members of the public (even those arriving late) were heard.

Documents within this Appendix

The following documents are provided within this Appendix:

- PowerPoint Presentation (6/15)
- Sign In Sheet (6/15)
- PowerPoint Presentation (6/18)
- Sign In Sheet (6/18)
- Press Release for Public Meetings

PowerPoint Presentation (6/15/2018)

VOLUSIA FLOODPLAIN MANAGEMENT PLAN

**PUBLIC MEETING
JUNE 15, 2018**





AGENDA

Welcome

Project Overview
Plan Overview
Questions and Concerns
Open House



AGENDA

Welcome

Project Overview
Plan Overview
Questions and Concerns
Open House



PROJECT OVERVIEW

Purpose:

Amend Floodplain Management Plan (FMP) to develop municipal specific FMPs based on Community Rating System Guidance.

Determine vulnerability to newly-released FEMA floodplain (2017 FIRM Maps)

Incorporate FMP into the County's Local Mitigation Strategy



COMMITTEE PARTICIPANTS

- Jurisdictional staff (*County, 14 Cities, 2 Towns*)
 - LMS Working Group
- Floodplain Managers
- NFIP Coordinator
- State Hazard Mitigation Officer



PUBLIC INVOLVEMENT

- Public Meetings (2)
 - DeLand, Daytona Beach
- Resident Survey
- Business Survey
- HOA Survey
- Comment on Draft Plan
 - The draft plan is available at www.ecfrpc.org.
 - Please send your comments to tara@ecfrpc.org



6/15 PowerPoint (Continued)

OTHER STEPS

- Assessment of the flood hazard using best available data (2017 DFIRM Maps).
- Review past flood claims and issues.
- Describe areas that provide natural and beneficial functions and habitat for rare and endangered species
- Analyze current and future development, redevelopment and population trends in comparison to the extent of the 100-year and 500-year floodplains.



FINAL STEPS

- Finalize Draft Plan**
Incorporation of all comments on the Draft Plan
- Adopt the Plan**
The County and all 16 jurisdictions will enact Resolutions of Adoption to adopt the plan.



AGENDA

Welcome
Project Overview
Plan Overview
Questions and Concerns
Open House



PLAN OVERVIEW

- ✓ Planning Process
- Vulnerability Assessment**
 - Impacts on Life, Safety & Health
 - Critical Facility Exposure
 - Property Value Exposure
 - Exposure by Land Use
 - Repetitive Loss Property Analysis
 - Flood Claim Analysis
- Mitigation Strategy and Action Plan**



MITIGATION STRATEGIES

- Flood Prevention
- Property Preventative
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Education and Awareness



OTHER PLAN SECTIONS

- Appendix A – Jurisdiction Profiles
 - Goals and Objectives
 - Flood Maps
 - Exposure Data (Land Use, Financial, Repetitive Loss)
- Appendix B – Public Survey Information
- Appendix C – Business Survey Information
- Appendix D – Neighborhood Association Survey
- Appendix E – Public Meeting Information
- Appendix G – Action Plan
- Appendix H – Public Comment on Draft Plan
- Appendix F & I – Resolutions of Support & Resolutions of Adoption



6/15 PowerPoint (Continued)

DRAFT FMP

Go to www.ecfrpc.org to view the draft Floodplain Management Plan
 ***Appendices will be added at the conclusion of public comment

Feedback

Please email your feedback to Tara McCue at tara@ecfrpc.org.
 The feedback deadline is July 10th, 2018.



QUESTIONS

Has the process of updating the Volusia County Floodplain Management Plan provided you with more knowledge of the purpose of the plan?

How satisfied are you with the public outreach conducted as part of the planning process for the plan update?

What additional feedback do you have concerning the Floodplain Management Plan?



AGENDA

Welcome
 Project Overview
 Plan Overview
Questions and Concerns
 Open House



OPEN HOUSE

Contact Us

Larry LaHue (llahue@volusia.org)
 Aubrie Austin (alastin@volusia.org)
 Tara McCue (tara@ecfrpc.org)
 Michelle Cechowski (michelle@ecfrpc.org)
 PJ Smith (pjsmith@ecfrpc.org)
 Mark Reali (mreali@ecfrpc.org)



Sign In Sheet (6/15/2018)



Volusia County Floodplain Management Plan Public Meeting

June 15, 2018
9:30 AM - 12:00 pm
DeLand Regional Library



NAME	Zip Code	Phone Number	Email Address
Suze Peace	32724	386-832-5469	4sfpeace@bellsouth.net
Larry Lurie	32174	386-254-1500	llurie@volusia.org
FRED PEACE	32724	386-738-0924	4sfpeace@bellsouth.net
Michelle Cechowski	32720	407-402-3761	michelle@ecfrpc.org
Aubrie Austin	32724	386 214 0029	alaustin@volusia.org
PJ SMITH	32801 (Non-Volusia)	407-496-5463	PJSMITH@ECFRPC.ORG
Mark Reali	34738	256 337 0872	mreali@ecfrpc.org

PowerPoint Presentation (6/18/2018)

VOLUSIA FLOODPLAIN MANAGEMENT PLAN

**PUBLIC MEETING
JUNE 18, 2018**




AGENDA

Welcome
Project Overview
Plan Overview
Questions and Concerns
Open House



AGENDA

Welcome
Project Overview
Plan Overview
Questions and Concerns
Open House



PROJECT OVERVIEW

Purpose:

Amend Floodplain Management Plan (FMP) to develop municipal specific FMPs based on Community Rating System Guidance.

Determine vulnerability to newly-released FEMA floodplain (2017 FIRM Maps)

Incorporate FMP into the County's Local Mitigation Strategy



COMMITTEE PARTICIPANTS

- Jurisdictional staff (County, 14 Cities, 2 Towns)
 - LMS Working Group
- Floodplain Managers
- NFIP Coordinator
- State Hazard Mitigation Officer



PUBLIC INVOLVEMENT

- Public Meetings (2)
 - Deland, Daytona Beach
- Resident Survey
- Business Survey
- HOA Survey
- Comment on Draft Plan
 - The draft plan is available at www.ecfrpc.org
 - Please send your comments to tara@ecfrpc.org



6/18 PowerPoint (Continued)

OTHER STEPS

- Assessment of the flood hazard using best available data (2017 DFIRM Maps).
- Review past flood claims and issues.
- Describe areas that provide natural and beneficial functions and habitat for rare and endangered species
- Analyze current and future development, redevelopment and population trends in comparison to the extent of the 100-year and 500-year floodplains.



FINAL STEPS

- Finalize Draft Plan**
Incorporation of all comments on the Draft Plan
- Adopt the Plan**
The County and all 16 jurisdictions will enact Resolutions of Adoption to adopt the plan.



AGENDA

Welcome
Project Overview
Plan Overview
Questions and Concerns
Open House



PLAN OVERVIEW

- ✓ Planning Process
- Vulnerability Assessment
 - Impacts on Life, Safety & Health
 - Critical Facility Exposure
 - Property Value Exposure
 - Exposure by Land Use
 - Repetitive Loss Property Analysis
 - Flood Claim Analysis
- Mitigation Strategy and Action Plan



MITIGATION STRATEGIES

- Flood Prevention
- Property Preventative
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Education and Awareness



OTHER PLAN SECTIONS

- Appendix A – Jurisdiction Profiles
 - Goals and Objectives
 - Flood Maps
 - Exposure Data (Land Use, Financial, Repetitive Loss)
- Appendix B – Public Survey Information
- Appendix C – Business Survey Information
- Appendix D – Neighborhood Association Survey
- Appendix E – Public Meeting Information
- Appendix G – Action Plan
- Appendix H – Public Comment on Draft Plan
- Appendix F & I – Resolutions of Support & Resolutions of Adoption



6/18 PowerPoint (Continued)

DRAFT FMP

Go to www.ecfrpc.org to view the draft Floodplain Management Plan
 ***Appendices will be added at the conclusion of public comment

Feedback:

Please email your feedback to Tara McCue at tara@ecfrpc.org.
 The feedback deadline is July 10th, 2018.



QUESTIONS

Has the process of updating the Volusia County Floodplain Management Plan provided you with more knowledge of the purpose of the plan?

How satisfied are you with the public outreach conducted as part of the planning process for the plan update?

What additional feedback do you have concerning the Floodplain Management Plan?



AGENDA

Welcome
 Project Overview
 Plan Overview

Questions and Concerns

Open House



OPEN HOUSE

Contact Us

Larry LaHue (llahue@volusia.org)

Aubrie Austin (alAustin@volusia.org)

Tara McCue (tara@ecfrpc.org)

Michelle Cechowski (michelle@ecfrpc.org)

PJ Smith (pjsmith@ecfrpc.org)

Mark Reali (mreali@ecfrpc.org)



Sign In Sheet (6/18/2018)



Volusia County Floodplain Management Plan Public Meeting

June 18, 2018
9:30 AM – 12:00 pm
City Island Library, Daytona Beach

[illegible]

Press Release



NEWS FOR IMMEDIATE RELEASE

June 6, 2018

Contact: Shelley Szafraniec, APR, CPRC
386-822-5062, ext. 15637

Public input sought on floodplain management plan

Volusia County's Emergency Management Division will host two public meetings to engage the community in the development of the Floodplain Management Plan. At the meetings the public can review and comment on the plan.

The meetings will be:

- 9:30 a.m. to noon
Friday, June 15, at the Deland Regional Library, 130 E. Howry Ave., DeLand
- 9 a.m. to noon
Monday, June 18, at the Daytona Beach Regional Library, 105 E. Magnolia Ave., Daytona Beach

The draft plan will be posted on www.edfrc.org on June 15th, 2018.

There are also several surveys available to provide comment. Residents are asked to complete the surveys and can complete more than one if applicable. The survey links are:

Business: <https://www.surveymonkey.com/r/2018VCBusiness>
Public: <https://www.surveymonkey.com/r/2018VCPublic>
Neighborhood: <https://www.surveymonkey.com/r/2018VCNeighborhood>

For more information, a copy of the agenda or to submit a comment by email, contact Michelle Cechowski at 407-245-0300 ext. 317. The deadline to submit comment is July 31st, 2018.

-30-



www.volusia.org						
VOLUSIA COUNTY COUNCIL						
ED KELLEY COUNTY CHAIR	JOYCE M. CUSACK AT-LARGE	DEBORAH DENYS VICE CHAIR, DISTRICT 3	PAT PATTERSON DISTRICT 1	BILLIE WHEELER DISTRICT 2	HEATHER POST DISTRICT 4	DR. FRED LOWRY DISTRICT 5

Appendix F

Resolutions of Support

City of Daytona Beach – Resolution of Support

RESOLUTION NO. 18-236

A RESOLUTION IN SUPPORT OF THE PLANNING PROCESS OF THE EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL FOR THE DEVELOPMENT AND INTEGRATION OF "THE VOLUSIA COUNTY LOCAL MITIGATION STRATEGY AND THE CITY'S FLOODPLAIN MANAGEMENT PLAN"; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System ("CRS") grades the various community Floodplain Management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised Floodplain Management Plan in alignment with the CRS Guidelines; and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the FMP into the Local Mitigation Strategy; and

WHEREAS, the Floodplain Management Plan will be completed in August of 2018; and

WHEREAS, Interim Utilities Director recommends the City support the planning process of the East Central Florida Regional Planning Council to further the goals of the Community Rating System and National Flood Insurance Program.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DAYTONA BEACH, FLORIDA:

SECTION 1. The City Commission considers the Floodplain Management Plan to be of the utmost importance to the City and supports the Floodplain Management Plan planning process.

SECTION 2. This Resolution shall take effect immediately upon its adoption.


DERRICK L. HENRY
Mayor

ATTEST:


LETITIA LAMAGNA
City Clerk

Adopted: July 18, 2018

Daytona Beach Shores – Resolution of Support

RESOLUTION NO. 2018-08

A RESOLUTION OF THE CITY OF DAYTONA BEACH SHORES, VOLUSIA COUNTY, FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY AND MUNICIPAL FLOODPLAIN MANAGEMENT PLAN"; PROVIDING A SAVINGS PROVISION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Article VIII, Section 2, *Constitution of the State of Florida*, authorizes the City of Daytona Beach Shores to exercise any power for municipal purposes except as otherwise provided by law; and

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, the County of Volusia has contracted with the East Central Florida Regional Planning Council (ECFRPC) to draft the revised Floodplain Management Plan (FMP) in alignment with the CRS Guidelines; and

WHEREAS, the ECFRPC is also required to integrate the FMP into the Local Mitigation Strategy; and

WHEREAS, the FMP will be revised in July 2018.

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF DAYTONA BEACH SHORES, FLORIDA, AS FOLLOWS:

SECTION ONE. FINDING. The City Council of the City of Daytona Beach Shores hereby considers the Floodplain Management Plan to be of the utmost importance to the City of Daytona Beach Shores and supports the Floodplain Management Plan Planning Process.

SECTION TWO. SAVINGS. The prior actions of the City of Daytona Beach Shores relating to floodplain management are hereby ratified and affirmed.

SECTION THREE: CONFLICTS. All resolutions or parts thereof in conflict with this

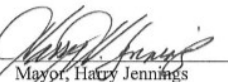
Res. 2018-08
Page 1 of 2

Resolution are hereby repealed to the extent of such conflict.

SECTION FOUR. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or application shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof.

SECTION FIVE. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

CITY OF DAYTONA BEACH SHORES, FLORIDA

By: 
Mayor, Harry Jennings

ATTEST:

By: 
Michael T. Booker, City Manager


Cheri Schwab, City Clerk

APPROVED AS TO FORM AND LEGALITY:

By: 
Lonnie Groot, City Attorney

Passed and adopted on first reading this 24 day of July, 2018.

Posted this 24 day of July, 2018.



DeBary – Resolution of Support

RESOLUTION NO: 18-17

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DEBARY, FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN"

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

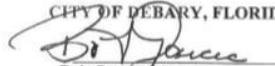
WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

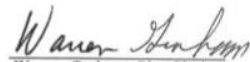
WHEREAS, The floodplain management plan will be revised in July 2018.

The City of DeBary considers the floodplain management plan to be of utmost importance to Volusia County and the City of DeBary, and supports the floodplain management plan planning process.

ADOPTED the 18th day of July, 2018.

CITY COUNCIL
CITY OF DEBARY, FLORIDA

Bob Garcia, Mayor

ATTEST:


Warren Graham, City Clerk

DeLand – Resolution of Support

RESOLUTION NO. 2018 -54

**A RESOLUTION OF THE CITY COMMISSION OF DELAND, FLORIDA
SUPPORTING THE VOLUSIA INTERGRATED FLOODPLAIN
MANAGEMENT PLAN; PROVIDING FOR AN EFFECTIVE DATE.**

WHEREAS, areas of the City of DeLand are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City Commission of the City of DeLand recognizes the importance of developing projects and programs to reduce or eliminate those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, proposed projects and programs have been incorporated into the current edition of the Volusia Integrated Floodplain Management Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF DELAND, FLORIDA:

Section 1. The City of DeLand hereby accepts and approves of its designated portion of the Volusia Integrated Floodplain Management Plan.

Section 2. The City of DeLand accepts and endorses the mitigation goals and objectives established for the countywide plan.

Section 3. The agencies and organizations within the City of DeLand will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the strategy.

Section 4. This Resolution shall become effective immediately upon its adoption.

PASSED AND DULY ADOPTED this 16th day of July, 2018.

ATTEST:

Julie A. Hennessy
Julie Hennessy
City Clerk-Auditor

Robert F. Apgar
Robert F. Apgar
Mayor-Commissioner

APPROVED AS TO FORM AND LEGALITY:

Darren J. Elkind
Darren J. Elkind
City Attorney

Edgewater – Resolution of Support

RESOLUTION #2018-R-12

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EDGEWATER, FLORIDA; IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN", REPEALING RESOLUTIONS IN CONFLICT HERewith; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, The floodplain management plan will be revised in July 2018.

NOW, THEREFORE, be it resolved by the City Council of the City of Edgewater, Florida as follows:

1

2018-R-12

Section 1. The City of Edgewater considers the floodplain management plan to be of utmost importance to Volusia County and the City of Edgewater, and supports the floodplain management plan planning process.

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or applications hereof.

Section 3. All resolutions or parts of resolutions in conflict herewith be and the same are hereby repealed.

Section 4. This resolution shall take effect immediately upon its adoption.

THIS SECTION INTENTIONALLY LEFT BLANK

2

2018-R-12

Section 5. After a motion to approve by Councilman Blazi with second by Councilwoman Power, the vote on this resolution as follows:

	AYE	NAY
Mayor Michael Ignasiak	✓	_____
Councilwoman Christine Power	✓	_____
Councilwoman Amy Vogt	✓	_____
Councilman Dan Blazi	✓	_____
Councilman Gary Conroy	✓	_____

PASSED, APPROVED AND ADOPTED this 16th day of July, 2018.

ATTEST:

Robin Matusick
Robin Matusick
City Clerk/Paralegal

**CITY COUNCIL OF THE
CITY OF EDGEWATER, FLORIDA**

By: Michael Ignasiak
Michael Ignasiak
Mayor

For the use and reliance only by the City of Edgewater, Florida. Approved as to form and legality by:
Aaron R. Wolfe, Esquire, City Attorney
Doran, Sims, Wolfe & Ciocchetti

Approved by the City Council of the City of Edgewater meeting held on this 16th day of July, 2018 under Item # 6j

3

2018-R-12

Oak Hill – Resolution of Support

RESOLUTION NO. 2018 - 06

A RESOLUTION OF THE CITY OF OAK HILL, VOLUSIA COUNTY, FLORIDA, IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPALITY FLOODPLAIN MANAGEMENT PLAN"; PROVIDING FOR SEVERABILITY; REPEALING RESOLUTIONS IN CONFLICT HERewith AND ESTABLISHING FOR AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with the CRS guidelines; and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the FMP into the local mitigation strategy; and

WHEREAS, the floodplain management plan will be completed in July of 2018; and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF OAK HILL, FLORIDA:

Section 1. The City Commission of the City of Oak Hill hereby considers the floodplain management plan to be of upmost importance to the City of Oak Hill and supports the floodplain management plan planning process.

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such

Section 3. All resolutions or parts of resolutions in conflict herewith are hereby repealed.

Section 4. This resolution shall take effect upon adoption.

It was moved by Commissioner Bittle and seconded by Commissioner Lindlau that said Resolution 2018 - 06, is passed on first reading. A roll call vote of the City Commission on said motion resulted as follows:

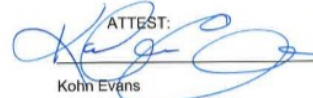
Mayor Gibson	<u>YES</u>
Vice Mayor Hyatt	<u>YES</u>
Commissioner Lindlau, Seat #2	<u>YES</u>
Commissioner Bittle, Seat #3	<u>YES</u>
Commissioner Bracy, Seat#4	<u>YES</u>

Passed upon first reading this 9th day of July, 2018.



Douglas A Gibson, Mayor

ATTEST:



Kohn Evans

City Clerk/Administrator

Approved as to form and legality for the use and reliance of the City of Oak Hill, Florida, only.



Scott E. Simpson, City Attorney

Ormond Beach – Resolution of Support (Page 1 of 2)

RESOLUTION NO. 2018-90

A RESOLUTION OF THE CITY OF ORMOND BEACH SUPPORTING THE PLANNING PROCESS TO UPDATE THE VOLUSIA COUNTY MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY THROUGH THE DEVELOPMENT OF A REVISED INTEGRATED FLOODPLAIN MANAGEMENT PLAN, AND SETTING FORTH AN EFFECTIVE DATE.

WHEREAS, areas of the City of Ormond Beach are vulnerable to coastal and riverine flooding that significantly threaten the safety of residents, and

WHEREAS, the National flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains, and

WHEREAS, the Community Rating System (CRS) rewards communities that exceed the minimum requirements of the NFIP that help citizens prevent or reduce flood losses, and

WHEREAS, the City of Ormond Beach has been an active participant in *Volusia Prepares*, the Local Mitigation Strategy (LMS) working group, which has established comprehensive, coordinated planning process involving the County and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, in a continuing effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, the City LMS representatives are working with Volusia County and the East Central Florida Regional Planning Council to draft a revised Floodplain Management Plan in alignment with the Community Rating System (CRS) guidelines, and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the FMP into the local mitigation strategy, and

WHEREAS, it is anticipated that the Floodplain Management Plan will be completed in April of 2019, now therefore,

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF ORMOND BEACH, FLORIDA, THAT:

SECTION ONE. The City Commission hereby considers the Floodplain Management Plan to be of utmost importance to the City of Ormond Beach and supports the planning process.

SECTION TWO. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED this 31st day of July, 2018.



BILL PARTINGTON
Mayor

ATTEST:



LISA DAHME
City Clerk

Ormond Beach – Resolution of Support (Page 2 of 2)



CITY OF ORMOND BEACH

City Manager • 22 S. Beach Street • Ormond Beach • Florida • 32174 • (386) 676-3200 • Fax (386) 676-3384

CITY MANAGER
MEMORANDUM

To: The Honorable Mayor Partington and City Commissioners

Through: Joyce A. Shanahan, City Manager

From: Steven Spraker, Planning Director

Date: July 31, 2018

Subject: Support of Planning Process to Develop an Integrated FMP

Commission Goal: N/A

Introduction:

This is a Resolution for the City Commission's support of the planning process to update the Volusia County Multi-Jurisdictional Local Mitigation Strategy Integrated Floodplain Management Plan.

Background

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000). Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate on mitigation planning activities, and makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program, both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally-approved hazard mitigation plan thereby become propositioned and are more apt to receive available mitigation funds before and after the next disaster strikes.

The Volusia County Multi-Jurisdictional Local Mitigation Plan was updated in 2013 by adopting the Floodplain Management Plan which integrated individual municipal Floodplain Management Plans. Every five years, the Floodplain Management Plan is required to be updated. For this reason, the County contracted with the East Central Florida Regional Planning Council to complete the update for 2018. The planning process for the update of the floodplain management plan is in accordance with the Community Rating System following steps:

Planning Process Steps

Page 1 of 3

Organize to Prepare the Plan
Involve the Public
Coordinate with other Agencies
Re-Assess the Hazard
Re-Assess the Problem
Review the Goals
Revise Action Plan
Adopt the Revised Plan

Budget Impact:

There is no budget impact to the City of Ormond Beach.

Citizen Impact:

The City of Ormond Beach is a CRS community and is currently rated as a 6, which provides a 20% flood insurance discount to policy holders in a special flood hazard area. The City is able to receive additional points by participating in the planning process in the development of the Volusia County Integrated Floodplain Management Plan which solidifies the current CRS rating and flood insurance discounts to the residents and exceeds the state and federal guidelines.

Recommendation:

It is recommended that the City Commission approve the Resolution to support the planning process in the update of the Volusia County Integrated Floodplain Management Plan.

Attachments:

- 18-090A - VOLUSIA COUNTY SUPPORT INTEGRATED FLOODPLAIN MANAGEMENT PLAN PROCESS P18-0091G MT # 3594 (PDF)

REVIEWED BY:

Kelly A. McGuire
Kelly McGuire, Finance Director 7/23/2018

Claire Whitley
Claire Whitley, Acting Assistant City Manager 7/23/2018

Page 2 of 3

APPROVED BY:

Joyce A. Shanahan
Joyce A. Shanahan, City Manager 7/25/2018

Appendix G Action Plan

LMS Flood Mitigation Initiatives

About the Action Plan

The Action Plan portion of the Floodplain Management Plan includes the active flood mitigation projects on the LMS Mitigation Initiatives spreadsheet. This listing is updated quarterly by the Volusia Prepares steering committee.

Completed and terminated projects have been removed from the project listing. In addition, projects that do not mitigate flood hazards have also been removed. Finally, projects that have gone past their originally scheduled "Completion Date" have a blank value within the "Completion Date" field.

The listing is effective July 2018 and includes updates from the June 2018 Volusia Prepares quarterly meeting. It is sorted by jurisdiction and project number.

Additional fields are included on the full project listing. For a complete project listing, please request a copy from the Volusia County Emergency Management office.

Category Prevention - **P** ----- Property Protection - **PP** ----- Structural - **S** ----- Emergency Services - **ES** ----- Public Education - **PE** ----- Non-Structural - **NS**

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0422		Daytona Beach	City of Daytona Beach	S	VOL-0422 Acquisition/Demolition of Repetitive Loss Structure	HMGP	\$1,975,155		Current
VOL-0423		Daytona Beach	City of Daytona Beach	S	VOL-0423 Acquisition/Demolition of Repetitive Loss Structure	HMGP FMA	\$2,028,000		Current
VOL-0425		Daytona Beach	City of Daytona Beach	S	VOL-0425 Acquisition/Demolition of Repetitive Loss Structure	HMGP FMA	\$2,153,500		Current
VOL-0432		Daytona Beach	City of Daytona Beach	S	VOL-0432 Acquisition/Demolition of repetitive loss structure	HMGP FMA	\$168,000		Current
VOL-0443		Daytona Beach	Public Works	P	VOL-0443 The city will be completing storm water mitigation along Orange Ave to reduce flooding in nearby critical facilities, repetitive loss properties and nearby neighborhoods and Historic Districts/Places	HMGP Local	\$20,000,000		Current
VOL-0446		Daytona Beach	City of Daytona Beach	S	VOL-0446 Acquisition and Demolition of repetitive loss structure: The residential structure on South Keech Street	HMGP FMA	\$55,547		Current
VOL-0044R		Daytona Beach	Utilities	S	VOL-0044 R B5/B6 Phase 2 - Nova Canal Drainage Basin	HMGP	\$8,000,000		Current
VOL-0165	H	Daytona Beach	Utilities	PP	VOL-0165 Stormwater/flood abatement	HMGP FMA	\$1,800,000		Current
VOL-0166	M	Daytona Beach	Utilities	PP	VOL-0166 A-5 barrier peninsula watershed Ocean Dunes Rd/Ocean	HMGP	TBD		Deferred
VOL-0168	M	Daytona Beach	Utilities	S	VOL-0168 B-3 Halifax River drainage basin-Wilder Outfall Study	HMGP FMA	\$1,400,000		Current
VOL-0413	H	Daytona Beach	Utilities	PP	RepLoss; Acquisition and Demolition.	HMGP FMA	\$110,000		Current
VOL-0418		Daytona Beach	Utilities	PP	VOL-0418 RepLoss; Acquisition and Demolition	HMGP FMA	\$229,800		Current
VOL-0288	H	DeBary	City of DeBary	S	VOL-0288 City of DeBary Emergency Outfall System	HMGP	\$4,669,590		Current
VOL-0346		DeBary	City of DeBary	PP	VOL-0346 Purchase 15 - 800 MHz radios	HMGP	TBD		Deferred
VOL-0347	L	DeBary	City of DeBary	ES	VOL-0347 Programmable message boards/trailers	HMGP	\$110,000		Current
VOL-0390	M	DeBary	City of DeBary	PE	VOL-0390 Community Information using an AM radio frequency EAS	HMGP	\$28,570		Current
VOL-0403	H	DeBary	City of DeBary	S	VOL-0403 Gravity Overflow Systems	HMGP	\$1,285,788		Current
VOL-0404	H	DeBary	City of DeBary	S	VOL-0404 East Side Flood Management System Upgrade	HMGP	\$2,126,225		Current
VOL-0414		DeBary	City of DeBary	S	VOL-0414 Implementation of a storm sewer system to prevent yard, roadway and structural flooding along Naranja Rd., 2nd street West and Alicante Rd., within the Plantation Estates Subdivision.	HMGP	\$220,856		Current
VOL-0415		DeBary	City of DeBary	S	VOL-0415 300 May Place Acquisition and Demolition Project	HMGP FMA	\$389,585		Current
VOL-0445		DeBary	Pegasus Eng., LLC	P	VOL-0445 Implementation of a storm sewer system to prevent yard, roadway and structural flooding along Shell Rd	HMGP FMA	\$147,673		Current
VOL-0002	H	DeLand	Public Works	S	VOL-0002 Construct a stormwater pumping station and force main	HMGP	TBD		Current
VOL-0053	H	DeLand	Public Services	ES	VOL-0053 Purchase/install emergency generator for Volusia County Fairgrounds	HMGP	\$70,000		Current
VOL-0054	H	DeLand	Public Services	ES	VOL-0054 Purchase/install emergency generator for Pistol Range Road	HMGP	\$70,000		Current
VOL-0241	H	DeLand	Public Services	S	VOL-0241 Acquisition and expansion of stormwater ponds	HMGP	\$4,220,000		Current
VOL-0242	H	DeLand	Public Services	S	VOL-0242 Raise head works and effluent pump station	HMGP	\$1,000,000		Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0349	H	DeLand	City of DeLand	PP	VOL-0349 Acquisition and expansion of stormwater for DeLand Middle	HMGP	TBD		Deferred
VOL-0351	H	DeLand	City of DeLand	PP	VOL-0351 Acquire flooded property along New Hampshire between Amelia Ave & Garfield	HMGP	\$500,000		Current
VOL-0510	28	DeLand	City of DeLand	PP NS ES	VOL-0510 Standby generator power for Sanborn Center which is used for meal prep for 1st responders in disaster	HMGP	\$110,424	Jan-21	Current
VOL-0073		Deltona	Public Works	S	VOL-0073 Lake level management program for Lake Theresa Basin lakes	HMGP	\$517,581		Current
VOL-0080		Deltona	Public Works	S	VOL-0080 Pump systems should either be enlarged or an emergency pump system set up	HMGP	\$48,620		Current
VOL-0081		Deltona	Public Works	S	VOL-0081 Provide a pumping system from the drainage retention area (DRA)	HMGP	\$127,565		Current
VOL-0082		Deltona	Public Works	S	VOL-0082 Culvert improvements for drainage retention area	HMGP	\$77,696		Current
VOL-0083		Deltona	Public Works	S	VOL-0083 "Big Ditch" connection between Lake Mitnik and Lake Doyle	HMGP	\$100,000		Current
VOL-0084		Deltona	Public Works	S	VOL-0084 Outfall improvements for drainage retention area adjacent to Beechdale Drive	HMGP	\$1,000,000		Current
VOL-0085	M	Deltona	Public Works	S	VOL-0085 Outfall improvements for Pioneer Lake	HMGP	\$90,803		Current
VOL-0086	M	Deltona	Public Works	S	VOL-0086 Outfall improvements for Castle Lake	HMGP	\$209,911		Current
VOL-0087		Deltona	Public Works	S	VOL-0087 Outfall improvements for drainage retention area south of Elkcam Boulevard	HMGP	\$141,474		Current
VOL-0088		Deltona	Public Works	S	VOL-0088 Culvert improvements at Elkcam Boulevard	HMGP	\$158,674		Current
VOL-0089		Deltona	Public Works	S	VOL-0089 Culvert improvements at Humphrey BLVD	HMGP	\$84,749		Current
VOL-0090	M	Deltona	Public Works	S	VOL-0090 Culvert improvements at Enterprise-Osteen Road	HMGP	\$31,606		Current
VOL-0091		Deltona	Public Works	S	VOL-0091 Culvert improvement at Braddock Road	HMGP	\$43,906		Current
VOL-0092		Deltona	Public Works	S	VOL-0092 Culvert improvement at Brickell Drive	HMGP	\$34,309		Current
VOL-0093		Deltona	Public Works	S	VOL-0093 Culvert improvement at Harbor Drive	HMGP	\$29,372		Current
VOL-0094		Deltona	Public Works	S	VOL-0094 Culvert improvements for Enterprise-Osteen Road	HMGP	\$17,340		Current
VOL-0095		Deltona	Public Works	S	VOL-0095 Culvert improvements for Doyle Road	HMGP	\$30,574		Current
VOL-0283		Deltona	City of Deltona	P	VOL-0283 Tivoli/wheeling drainage project	HMPG	\$200,000		Current
VOL-0284		Deltona	City of Deltona	P	VOL-0284 Drainage project	HMPG	\$550,000		Current
VOL-0376	M	Deltona	Fire	PE	VOL- 0376 Public Education Specialist	HMGP	\$45,000		Current
VOL-0406	M	Deltona	Public Works	S	VOL-0406 Lake Lapanocia Pump Station	HMGP	\$200,000		Current
VOL-0407	M	Deltona	Public Works	S	VOL-0407 Piedmont Pump Station	HMGP	\$150,000		Current
VOL-0408	M	Deltona	Public Works	S	VOL-0408 Kingsway/Lehigh Culvert	HMGP	\$200,000		Current
VOL-0409	M	Deltona	Public Works	S	VOL-0409 Tivoli & Wheeling Pump	HMGP	\$500,000		Current
VOL-0460		Deltona	Public Works		VOL-0460 Exmore Avenue Stormwater Improvements	HMGP	\$150,000		Current
VOL-0461		Deltona	Public Works		VOL-0461 Lamplighter Section Line Stormwater Improvements	HMGP FMA	\$415,000		Current
VOL-0463		Deltona	Public Works		VOL-0463 Montebello Avenue Stormwater Improvements	HMGP FMA	\$250,000		Current

Category Prevention - **P** ----- Property Protection - **PP** ----- Structural - **S** ----- Emergency Services - **ES** ----- Public Education - **PE** ----- Non-Structural - **NS**

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0464		Deltona	Public Works		VOL-0464 Picasso Avenue Stormwater Improvements	HMGP FMA	\$415,000		Current
VOL-0465		Deltona	Public Works		VOL-0465 Tune Avenue Stormwater Improvements	HMGP FMA	\$225,000		Current
VOL-0466		Deltona	Public Works		VOL-0466 Zinnia Avenue Stormwater Improvements	HMGP FMA	\$210,000		Current
VOL-0531	25	Deltona	City of Deltona	PP S ES	VOL-0531 Hardening Critical Facilities in Deltona: Station 64	Retrofit	\$68,468	Jan-21	Current
VOL-0532	25	Deltona	City of Deltona	PP S ES	VOL-0532 Hardening Critical Facilities in Deltona: Deltona Water	Retrofit	\$75,635	Jan-21	Current
VOL-0533	25	Deltona	City of Deltona	PP S ES	VOL-0533 Hardening Critical Facilities in Deltona: Public Works	Retrofit	\$116,714	Jan-21	Current
VOL-0066		Edgewater	Fire	PE	VOL-0066 Educate citizens about CEMP, by using CERT members.	HMGP	TBD		Current
VOL-0070	M	Edgewater	Fire	ES	VOL-0070 Purchase emergency back-up generator for the YMCA	HMGP	\$60,000		Current
VOL-0334R	M	Edgewater	Fire	PP	VOL-0334R Acquire repetitive loss home at Cheeta Drive	HMGP	\$241,810		Current
VOL-0424	21	Edgewater	City of Edgewater	ES	VOL-0424 Purchase two (2) portable 6" pumps	HMGP	\$84,244		Current
VOL-0485	24	Edgewater	Public Works	P PP S NS	VOL-485 - Generators for City of Edgewater lift stations (4)	HMGP	\$196,996	Jan-21	Current
VOL-0486	23	Edgewater	Public Works	NS ES	VOL-0486 Portable Generators - Traffic Signals (7)	HMGP	\$4,389	Jan-21	Current
VOL-0487	22	Edgewater	Public Works	NS ES	VOL-0487 - Edgewater Code House generator	HMGP	\$10,000	Jan-21	Current
VOL-0496	21	Edgewater	Public Works	NS ES	VOL-0496 - Edgewater City Hall generator - purchase & installation	HMGP	\$133,919	Jan-21	Current
VOL-0497	21	Edgewater	Public Works	NS ES	VOL-0497 - Water Treatment Plant/EOC Generator replacement	HMGP	\$350,000	Jan-21	Current
VOL-0498	20	Edgewater	Public Works	P PP S NS	VOL-0498 - Acquire & demolish repetitive flood loss home at 405 Hart Avenue	HMGP FMA	\$227,000	Jan-21	Current
VOL-0499	20	Edgewater	Public Works	P PP S	VOL-0499 - Menard May Park Erosion Project shoreline stabilization. Timber pier replacement, fishing pier lighting, & upland retaining wall.	HMGP	\$254,925	Jan-21	Current
VOL-0542	24	Edgewater	City of Edgewater	P PP S ES	VOL-0542 Improvement #1 to 50 lift stations in Edgewater	HMGP	\$150,000	Jan-21	Current
VOL-0543	24	Edgewater	City of Edgewater	P PP S ES	VOL-0543 Improvement #2 to 50 lift stations in Edgewater	HMGP	\$150,000	Jan-21	Current
VOL-0544	24	Edgewater	City of Edgewater	P PP S ES	VOL-0544 Improvement #3 to 50 lift stations in Edgewater	HMGP	\$150,000	Jan-21	Current
VOL-0475	40	FL Hospital	EM Coordinator	PP ES	VOL-0475 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Memorial Medical	HMGP	\$2,400,000	Jan-21	Current
VOL-0476	40	FL Hospital	EM Coordinator	ES	VOL-0476 Emergency power upgrade for hospital critical infrastructure sustainability during power outages at FL Hospital Oceanside	HMGP	\$850,000	Jan-21	Current
VOL-0500	33	Halifax Health	Halifax Health	P PP S NS ES	VOL-0500 - Data Center hardening @ Daytona Beach campus	HMGP	\$2,000,000	Jan-21	Current
VOL-0502	34	Halifax Health	Halifax Health	P PP NS ES	VOL-0502 Replacement of 3 (1960 Diesel) Emergency power generators and transfer switches	HMGP	\$4,750,000	Jan-21	Current
VOL-0503	34	Halifax Health	Halifax Health	P PP NS ES	VOL-0503 Emergency power for HVAC equipment at Port Orange Hospital facility	HMGP	\$300,000	Jan-21	Current
VOL-0534	37	Halifax Health	Halifax Health	P PP	VOL-0534 Hardening of Hospice Critical Care Site at Port Orange Beach Care Center 2nd Floor	HMGP	\$277,500	Jan-21	Current
VOL-0535	37	Halifax Health	Halifax Health	P PP	VOL-0535 Hardening of Hospice Critical Care Site at Ormond Beach Care Center	HMGP	\$109,900	Jan-21	Current
VOL-0536	37	Halifax Health	Halifax Health	P PP	VOL-0536 Hardening of Hospice Critical Care Site at Southeast Volusia Care Center	HMGP	\$187,650	Jan-21	Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0537	37	Halifax Health	Halifax Health	P PP	VOL-0537 Hardening of Hospice Critical Care Site at West Volusia Care Center	HMGP	\$150,950	Jan-21	Current
VOL-0278	L	Holly Hill	City of Holly Hill	S	VOL-0278 Trailer mounted emergency pumps- Jursidiction requested to	HMGP	\$34,370		Current
VOL-0279	L	Holly Hill	Public Works	S	VOL-0279 State Avenue (6th - 8th St) Department Stormwater-	HMGP	\$76,000		Current
VOL-0280	L	Holly Hill	Public Works	S	VOL-0280 Tuscaloosa Street drainage Department improvements-	HMGP	\$98,000		Current
VOL-0281	L	Holly Hill	Public Works	S	VOL-0281 Eagle Drive and Peacock Rd Department Drainage	HMGP	\$100,000		Current
VOL-0282	L	Holly Hill	Public Works	S	VOL-0282 Espanola Ave Drainage Department Improvements-	HMGP	\$275,000		Current
VOL-0357	L	Holly Hill	City of Holly Hill	PP	VOL-0357 Cave Avenue Structure purchase- Jursidiction requested to	HMGP	\$55,000		Current
VOL-0457		Holly Hill	City of Holly Hill	PP	VOL-0457 Hurricane shutters and City Hall Annex	HMGP	\$12,000		Current
VOL-0474	21	Holly Hill	Public Works	PP	VOL-0474 Cordova Drainage Basin Improvements Phase I	HMGP	\$1,529,875	Jan-21	Current
VOL-0507	33	Holly Hill	City of Holly Hill	PP S	VOL-0507 Drainage improvements - installation of 29 duckbill valves along outfalls to Halifax River	HMGP	\$350,000	Jan-21	Current
VOL-0508	31	Holly Hill	City of Holly Hill	PP	VOL-0508 - Shutters for City Hall	HMGP	\$25,067	Jan-21	Current
VOL-0530	29	Holly Hill	Public Works	P	VOL-0530 Drainage Improvements South Espanola Avenue	HMGP	\$318,000	Jan-21	Current
VOL-0545	29	Holly Hill	City of Holly Hill	P ES NS	VOL-0545 Generator for Sica Hall	HMGP	\$70,000	Jan-21	Current
VOL-0553		Holly Hill	City of Holly Hill	S	VOL-0553 Refurbishment of Lift Station # 9	TBD	TBD	TBD	TBD
VOL-0554		Holly Hill	City of Holly Hill	S	VOL-0554 Refurbishment of Lift Station # 19	TBD	TBD	TBD	TBD
VOL-0555		Holly Hill	City of Holly Hill	S	VOL-0555 Refurbishment of Lift Station # 21	TBD	TBD	TBD	TBD
VOL-0504	21	Lake Helen	City of Lake Helen	PP NS	VOL-0504 City of Lake Helen Virginia Drive Sub-base stabilization and repaving.	HMGP	\$229,830	Jan-21	Current
VOL-0505	24	Lake Helen	City of Lake Helen	NS	VOL-0505 City of Lake Helen Ohio stormwater culvert	HMGP	\$90,000	Jan-21	Current
VOL-0506	27	Lake Helen	City of Lake Helen	PP	City of Lake Helen Police Dept/EOC flood and wind prevention by sealing for water and protecting doors & windows	HMGP	\$41,175	Jan-21	Current
VOL-0520	20	Lake Helen	City of Lake Helen	ES	VOL-0520 City of Lake Helen Pre-Disaster Mitigation Proposal	HMGP	\$21,161	Jan-21	Current
VOL-0103R	L	New Smyrna	Fire Service	ES	VOL-0103R Relocate and replace Fire Department Station #50 (main	HMGP	\$2,000,000		Current
VOL-0386	M	New Smyrna Beach	City of NSB	PP	Vol-0386 Central Beachside Flood Mitigation Project Phase II	FEMA	\$1,808,000		Current
VOL-0410	M	New Smyrna Beach	City of NSB	S	VOL-0410 New Smyrna Beach Central Beachside Storm Water Management Project	HMGP	\$2,500,000		Current
VOL-0467		New Smyrna Beach	Fire Service		VOL-0467 Isleboro subdivison storm water management project, of building a retention pond.	HMGP	\$3,500,000		Current
VOL-0549	28	New Smyrna	City of NSB	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	\$4,802,280	Jan-21	Current
VOL-0550	28	New Smyrna	City of NSB	P PP S	VOL-0549 Elevation of flood- prone homes	HMGP	\$6,650,121	Jan-21	Current
VOL-0398	H	Orange City	City of Orange City	S	VOL-0398 Fawn Ridge Subdivision	HMGP	\$500,000		Current
VOL-0399	H	Orange City	City of Orange City	S	VOL-0399 Treemont Drainage Project	HMGP	\$500,000		Current
VOL-0451		Orange City	City of Orange City	PP	VOL-0451 Mill Lake & Pooser Pond Stormwater improvement. Install stormwater pump stations to prevent flooding.	HMGP	TBD		Current
VOL-0050	M	Ormond Beach	Public Works	S	VOL-0050 Drainage improvements to areas of "Old Ormond" (mainland)	HMGP	\$500,000		Current
VOL-0174		Ormond Beach	City of Ormond Beach	ES	VOL-0174 Purchase mobile command center for use during an	HMGP	\$100,000		Current
VOL-0387	M	Ormond Beach	City of Ormond Beach	S	Vol-0387 Thompson Creek Stormwater Department Improvement	HMGP	\$65,000		Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0435		Ormond Beach	City of Ormond Beach	PP	VOL-0435 This initiative is to acquire at risk structures in the Central Park area along Laurel Creek Thompson Creek and FP&L Ditch, including 2 repetitive Loss structures.	HMGP FMA	\$46,500,000		Current
VOL-0442		Ormond Beach	Emergency Mgmt.	PP	VOL-0442 Central Park Drainage Improvements - will provide flood mitigation benefits by acquisition of land and construction of control structure for discharge to Pond 4, as well as excavating a channel to connect Pond 3 & 4	HMGP FMA	\$293,000		Current
VOL-0452		Ormond Beach	City of Ormond Beach	S	VOL-0452 Flooding control pump on Fleming Ave, which will discharge into the Halifax River	HMGP	\$8,635,265		Current
VOL-0468		Ormond Beach	Engineering Division	P	VOL-0468 772 N Beach St. Convert property into a stormwater storage site to aid with the prevention of flooding.	FMA	\$188,000		Current
VOL-0472	33	Ormond Beach	Public Works	PP P	VOL-0472 Wilmette Avenue Stormwater Pump Station - install permanent pump station Laurel Creek	HMGP	\$254,754	Jan-21	Current
VOL-0473	33	Ormond Beach	Public Works	PP ES	VOL-0473 Ormond Beach Lift Station backup - purchase 4 pumps	HMGP	\$185,492	Jan-21	Current
VOL-0509	34	Ormond Beach	City of Ormond Beach	ES	VOL-0509 Ormond Beach Emergency Operations Center - build Community Center that will be used as EOC in disaster	HMGP	\$1,500,000	Jan-21	Current
VOL-0512	38	Ormond Beach	City of Ormond Beach	P PP NS	VOL-0512 Fleming Avenue Stormwater improvements	HMGP	\$500,000	Jan-21	Current
VOL-0521	39	Ormond Beach	City of Ormond Beach	P PP NS	VOL-0521 Woodrige Drive Drainage Improvements	HMGP	\$185,000	Jan-21	Current
VOL-0540	28	Ormond Beach	City of Ormond Beach	P PP S	VOL-0540 Elevate and retrofit flood damaged home- 520 W St. Ormond Beach, FL	HMGP	\$300,000	Jan-21	Current
VOL-0546	34	Ormond Beach	City of Ormond Beach	P PP ES	VOL-0546 Strickland Creek flood protection	HMGP	\$12,000,000	Jan-21	Current
VOL-0547	31	Ormond Beach	City of Ormond Beach	P PP	VOL-0547 Drainage improvements	HMGP	\$1,400,000	Jan-21	Current
VOL-0556		Ormond Beach	City of Ormond Beach	P PP S	VOL-0556 Elevation of Severe Repetitive Loss home: 89 N. St. Andrews		TBD		Current
VOL-0218		Pierson	Town of Pierson	P	VOL-0218 Secure water supply	HMGP	\$50,000	Jan-21	Current
VOL-0219		Pierson	Town of Pierson	ES	VOL-0219 Establish an Emergency Operations Center in Community	HMGP	\$225,000	Jan-21	Current
VOL-0221		Pierson	Town of Pierson	S	VOL-0221 Establish stormwater management maintenance program	HMGP	\$60,000	Jan-21	Current
VOL-0450		Pierson	Town of Pierson	ES	VOL-0450 Purchase and install emergency generator @ Pierson Town	HMGP	\$70,000	Jan-21	Current
VOL-0173	H	Ponce Inlet	Fire Service	ES	VOL-0173 Purchase the equipment necessary to equip a mobile command center	HMGP	\$50,000		Current
VOL-0419		Ponce Inlet	VC Emergency Mgmt.	S	VOL-0419 Install hurricane resistant windows & doors on Fire Station.	HMGP	\$44,000		Current
VOL-0420	H	Ponce Inlet	Town of Ponce Inlet	S	VOL-0420 Purchase 4" Pump for flood control	HMGP	\$44,000		Current
VOL-0130	M	Port Orange	City of Port Orange	PP	VOL-0130 Purchase Seabird Island; remove mobile homes, and convert	HMGP	TBD		Deferred
VOL-0158		Port Orange	City of Port Orange		VOL-0158 Retrofit old 175 kw generator into a portable unit that can be used anywhere	HMGP Local	\$30,000		Current
VOL-0160		Port Orange	City of Port Orange	P	VOL-0160 Install coquina rock to prevent erosion along Halifax River	HMGP	\$80,000		Current
VOL-0169R	M	Port Orange	City of Port Orange	ES	VOL-0169R Retrofit the Port Orange Cypress Head golf course banquet	HMGP	\$350,000		Current
VOL-0228	H	Port Orange	City of Port Orange	S	VOL-0228 Taylor Woods and S. Williamson Drainage retrofit	HMGP	\$750,000		Current
VOL-0229	H	Port Orange	City of Port Orange	S	VOL-0229 Taylor RD Drainage retrofit	HMGP	\$2,500,000		Current
VOL-0391	H	Port Orange	VC Emergency Mgmt.	S	VOL-0391 B-23 Canal Seawall Improvement	HMGP	\$2,800,000		Current

Category Prevention - P ----- Property Protection - PP ----- Structural - S ----- Emergency Services - ES ----- Public Education - PE ----- Non-Structural - NS

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0438		Port Orange	VC Emergency Mgmt.	P	VOL-0438 Halifax/ Nova Road Drainage - to utilize existing City of Port Orange property (Thompson), the intent is to construct a three acre stormwater pond to create capacity along the Halifax/Nova Road Canal which caused flood damage to 151 structures (residential and non-residential) in May 2009.	HMGP	\$2,000,000		Current
VOL-0439		Port Orange	VC Emergency Mgmt.	P	VOL-0439 The Intent of the project is to acquire the Summit Golf property	HMGP	\$1,000,000		Current
VOL-0440		Port Orange	VC Emergency Mgmt.	P	VOL-0440 Port Orange's intent is to mitigate flooding of Dunlawton Ave S.R> 421, a major evacuation route to I-95, by purchasing properties and installing retrofit drainage improvements.	HMGP	\$800,000		Current
VOL-0441		Port Orange	VC Emergency Mgmt.	PP	VOL-0441 Acquire properties identified at the end of Spruce Creek Road to install retrofit drainage improvements to mitigate flooding	HMGP	\$429,000		Current
VOL-0480	38	Port Orange	Public Works	P PP S	VOL-0480 White Place and Riverside Drive drainage improvements	HMGP	\$80,000	Jan-21	Current
VOL-0481	32	Port Orange	Public Works	P PP S	VOL-0481 Tumblebrook Drive (Sweetwater Hills) stormwater improvements (201409)	HMGP	\$131,000	Jan-21	Current
VOL-0482	34	Port Orange	Public Works	P PP S	VOL-0482 Southwinds Stormwater Pond Outfall Retrofit (201441)	HMGP	\$1,295,000	Jan-21	Current
VOL-0483	38	Port Orange	Public Works	P PP S	VOL-0483 Pipe replacement (201647) replace pipe with reinforced concrete pipe to improve stormwater conveyance to reduce potential	HMGP	\$5,000,000	Jan-21	Current
VOL-0484	39	Port Orange	Public Works	P PP S	VOL-0484 Storm drain pipe lining (180202)	HMGP	\$841,172	Jan-21	Current
VOL-0515	35	Port Orange	Public Works	ES	VOL-0515 Backup generators for Fire Stations 71 and Fire Station 73	HMGP	\$133,000	Jan-21	Current
VOL-0519	38	Port Orange	Public Works	P S PP	VOL-0519 Virginia and Monroe Street Drainage Improvement	HMGP	\$269,250	Jan-21	Current
VOL-0541	32	Port Orange	City of Port Orange	P PP NS	VOL-0541 Howes Street drainage improvements	HMGP	\$455,250	Jan-21	Current
VOL-0516	28	School Board	School Board	NS ES PE	VOL-0516 Provide emergency generators for 9 shelter locations	HMGP	\$540,000	Jan-21	Current
VOL-0517	28	School Board	School Board	NS ES PE	VOL-0517 Upgrade 6 shelter locations - provide emergency generator connections and air quality improvements	HMGP	\$258,000	Jan-21	Current
VOL-0518	28	School Board	School Board	NS ES PE	VOL-0518 Upgrade 3 shelter locations - provide emergency generators connections and air quality improvements	HMGP	\$129,000	Jan-21	Current
VOL-0389	H	South Daytona	City of South Daytona	PP	Vol-0389 South Daytona EOC/Public Works Facility	HMGP	\$6,200,000		Current
VOL-0447		Daytona Beach	Daytona Beach	S, PP	VOL-0447 Acquisition/Demolition of repetitive loss structure: The residential structure at South Carolina Street had two insured flood losses 9/16/2004 and 5/20/2009 for a combined insurance payout of 67,	HMGP FMA	\$57,913		Current
VOL-0453		South Daytona	City of South Daytona	P	VOL-0453 Purchase a vacant parcel of land & install a stormwater retention pond to help recent flooding .	HMGP	\$300,000		Current
VOL-0469		South Daytona	City of South Daytona	P	VOL-0469 construction of stormwater management system adjacent to City Hall. This will help emergency vehicles have more access to the road during minor storm events.	HMGP	\$340,000		Current
VOL-0511	33	South Daytona	City of South Daytona	ES	VOL-0511 permanent generator for the Piggotte Center - critical facility during disasters	HMGP	\$80,000	Jan-21	Current
VOL-0552	26	South Daytona	City of South Daytona	P PP S	VOL-0549 Elevation of flood- prone home	HMGP	\$1,169,000	Jan-21	Current
VOL-0023	M	Unincorporated	VC Emergency Mgmt.	P	VOL-0023 Develop and implement a Community Emergency Management Academy	HMGP	TBD		Deferred

Category Prevention - **P** ----- Property Protection - **PP** ----- Structural - **S** ----- Emergency Services - **ES** ----- Public Education - **PE** ----- Non-Structural - **NS**

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0026		Unincorporated	Private Agencies	PP	VOL-0026 Develop a countywide contractor licensing program	HMGP Local	\$15,000	Jan-21	Current
VOL-0027	M	Unincorporated	VOL2020 MP Subcommittee	PP/PE/P/S	VOL-0027 LMS Steering Committee support a home mitigation education & incentive program	HMGP	TBD	Jan-21	Current
VOL-0038		Unincorporated	VC Road & Bridge	S	VOL-0038 Replace Bridge #794010 (Taylor Road over B-19)	HMGP	\$250,000	Jan-21	Current
VOL-0045		Unincorporated	Private Agencies	PP	VOL-0045 Protect United Way Headquarters with generator & window protection	HMGP	\$43,000	Jan-21	Current
VOL-0115	H	Unincorporated	VC Fire Service	ES	VOL-0115 Replace existing Fire Station 23	HMGP	\$2,000,000	Jan-21	Current
VOL-0132		Unincorporated	Private Agencies	ES	VOL-0132 Fund CERV program	HMGP	TBD	Jan-21	Current
VOL-0153	H	Unincorporated	VC Fire Service	ES	VOL-0153 Construct a structural collapse training facility	HMGP	TBD	Jan-21	Current
VOL-0154	H	Unincorporated	VC Fire Service	ES	VOL-0154 Purchase specialized rescue equipment	HMGP	TBD	Jan-21	Current
VOL-0181	M	Unincorporated	Private Agencies	S	VOL-0181 Infrastructure placement in Tomoka Estates Subdivision	HMGP	\$1,230,848	Jan-21	Current
VOL-0198	M	Unincorporated	VC Sheriff Dept.	ES	VOL-0198 Updated 09/10/08 Construct a hardened, centralized evidence	HMGP	\$412,000	Jan-21	Current
VOL-0201	L	Unincorporated	VC Emergency Mgmt.	PP	VOL-0201 Increase the base flood elevation requirement	Local	TBD		Deferred
VOL-0204	M	Unincorporated	VC Emergency Mgmt.	ES	VOL-0204 Integrate and expand the existing CERT programs	HMGP	\$135,000	Jan-21	Current
VOL-0255	M	Unincorporated	Public Works	PP	VOL-0255 Volusia County Public Works Service Center	HMGP	\$500,000	Jan-21	Current
VOL-0265		Unincorporated	VC Env. Management	NRP	VOL-0265 Habitat Stabilization/Revegetation Project	HMGP	TBD		Deferred
VOL-0266		Unincorporated	VC Env. Management	PP	VOL-0266 Shoreline Erosion Control and Restoration Project	HMGP	TBD		Deferred
VOL-0267	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0267 Stone Island Flood Mitigation Project	HMGP	\$5,000,000	Jan-21	Current
VOL-0268	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0268 Tomoka Estates Flood Mitigation Project	HMGP	\$10,000,000	Jan-21	Current
VOL-0270	H	Unincorporated	VC Fire Service	ES	VOL-0270 Emergency Power for 4 County Fire Stations	HMGP	\$80,000	Jan-21	Current
VOL-0271	H	Unincorporated	VC Fire Service	ES	VOL-0271 Training Facility Improvements	HMGP	\$3,000,000	Jan-21	Current
VOL-0274	H	Unincorporated	VC Fire Service	ES	VOL-0274 Weather Stations for 22 Fire Stations	HMGP	\$11,000	Jan-21	Current
VOL-0290	H	Unincorporated	VC Fire Service	ES	VOL-0290 Replace Fire Station 43 in Seville	HMGP	\$2,000,000	Jan-21	Current
VOL-0291	H	Unincorporated	VC Fire Service	ES	VOL-0291 Replace Fire Station 13 in Ormond Beach	HMGP	\$2,000,000	Jan-21	Current
VOL-0292	H	Unincorporated	VC Fire Service	ES	VOL-0292 Replace Fire Station 15 in Daytona Beach	HMGP	\$2,000,000	Jan-21	Current
VOL-0293	H	Unincorporated	VC Fire Service	ES	VOL-0293 Replace Fire Station 41 in DeLeon Springs	HMGP	\$2,000,000	Jan-21	Current
VOL-0294	H	Unincorporated	VC Fire Service	ES	VOL-0294 Replace Fire Station 32 in DeLand	HMGP	\$2,000,000	Jan-21	Current
VOL-0320	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0320 DEMO/REBUILD REPETITIVE LOSS HOME AT 1633 SPRING GARDEN DRIVE ASTOR	HMGP	TBD		Deferred
VOL-0321R	M	Unincorporated	VC Emergency Mgmt.	PP	VOL-0321R Elevate & retrofit rep loss property at Stone Trail, Enterprise	HMGP	TBD		Deferred
VOL-0366	M	Unincorporated	VC Emergency Mgmt.	PE	VOL-0366 Understanding Volusia County's demographics to anticipate behavior & mitigate hazards	HMGP	TBD		Deferred
VOL-0368	M	Unincorporated	VC Emergency Mgmt.	PE	VOL-0368 Condominium mitigation video	HMGP	TBD		Deferred
VOL-0416		Unincorporated	VC Emergency Mgmt.	S	VOL-0416 Nova Canal Outfall Improvements	HMGP FMA	\$15,000,000	Jan-21	Current
VOL-0431		Unincorporated	VC Emergency Mgmt.	PP	VOL-0431 Acquire and Demolition 2 structures located at 1890 Pioneer TR, NSB	HMGP	TBD		Deferred
VOL-0514	32	Unincorporated	Public Works	P P P S	VOL-0514 Rio Way Regional Retention Pond	HMGP	\$3,000,000	Jan-21	Current
VOL-0522	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0522 1048 Shockney Drive Elevation & Retrofit	HMGP	\$368,900	Jan-21	Current

Category Prevention - **P** ----- Property Protection - **PP** ----- Structural - **S** ----- Emergency Services - **ES** ----- Public Education - **PE** ----- Non-Structural - **NS**

Project #	Priority	Jurisdiction	Responsible Organization	Mitigation Technique Category	Initiative	Funding	Estimated Cost	Completion Date	Status
VOL-0523	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0523 1013 Shockney Drive Elevation & Retrofit	HMGP	\$422,400	Jan-21	Current
VOL-0524	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0524 988 Shockney Drive Elevation & Retrofit	HMGP	\$384,300	Jan-21	Current
VOL-0525	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0525 356 Seminole Drive Elevation & Retrofit	HMGP	\$384,300	Jan-21	Current
VOL-0526	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0526 Cherokee Road Elevation & Retrofit	HMGP	\$379,800	Jan-21	Current
VOL-0527	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0527190 Flamingo Drive Elevation & Retrofit	HMGP	\$411,050	Jan-21	Current
VOL-0528	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0528 241 Cherokee Road Elevation & Retrofit	HMGP	\$377,500	Jan-21	Current
VOL-0529	28	Unincorporated	VC Emergency Mgmt.	P P P S	VOL-0529 1052 Shockney Drive Elevation & Retrofit	HMGP	\$382,650	Jan-21	Current



Appendix H

Public Comment on Draft Plan

Overview

Public comment consisted of two portions:

1. Planning Meeting Comments on Draft Plan

Public Comment received during the two planning meetings. Summaries of the topics of discussion and input received are located within this section in bullet point format.

2. Email Comments on Draft Plan

A public comment process was advertised online and during the public meetings. The public comment period allowed residents to comment on the draft plan and lasted through July 2018. No comments were received as part of this process.

Public Comment Notes – Public Meetings

Questions from the public on administrative and process issues are not included below.

June 15th Public Meeting

- *6/15, Suze Peace and Fred Peace:* The County needs to look into the potential impacts of sea level rise on future flooding conditions.
- *6/15, Suze Peace and Fred Peace:* The impact of interstate-4 and other transportation projects has decreased water quality in the DeBary area. Water quality should be addressed in the plan.
- *6/15, Suze Peace and Fred Peace:* The impacts of development on the size of the floodplain should be addressed
- *6/15, Suze Peace and Fred Peace:* Discussed regulations on development in flood-prone areas, and went into detail in discussing the importance of retention pond TMDL limits. The project team explained the county policy for retention ponds on each side of the County.
- *6/15, Suze Peace and Fred Peace:* Discussion of the CRS point system, origins of the “integrated” plan, benefits to the community (financial, etc.)

June 18th Public Meeting

- *6/18, Michaela Harbour and Donald Roman:* Bethune Point is a repeat flood hazard area; it is suggested that the project team add this to the frequent flooding locations map within the FMP.
- *6/18, Donald Roman:* Inquired about the process of debris removal and plans that communicate with the FMP to meet the needs of the County. Mr. Roman emphasized the importance of quick debris removal and the slow response time during the 2017 Hurricane season.
- *6/18, Donald Roman:* It will be important to monitor sea level rise in real time to gauge the accuracy of predictions that have been made.
- *6/18, Donald Roman and Michaela Harbour:* Residents informed the project team that a number of residents on the lagoon experience vastly different flooding effects depending on the direction of the storm. These people may need more in-depth instructions on how to deal with variabilities in the effects of wind direction.
- *6/18, Donald Roman:* Inquired about the potential cause of sea level rise being subsidence due to development along Florida's coastline. Inquired about the root causes and how the plan will deal with these questions
- *6/18, Donald Roman:* Inquired about how, if development is inevitable, the County will stop future development from occurring in flood-prone areas. Mr. Roman has expressed an interest that these issues be addressed in the plan.
- *6/18, Donald Roman:* Mr. Roman asks about the Action Plan and the types of projects that are covered.

Appendix I

Resolutions of Adoption

City of Daytona Beach – Resolution of Adoption

RESOLUTION NO. 18-347

A RESOLUTION ADOPTING THE 2018 VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and

WHEREAS, the National Flood Insurance Program provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirements; and

WHEREAS, efforts have been made to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

WHEREAS, the adoption of the 2018 Volusia County Integrated Floodplain Management Plan is in alignment with the Community Rating System Guidelines, and integration into the Local Mitigation Strategy supports this effort; and

WHEREAS, adoption of the plan is a requirement of the Community Rating System; and

WHEREAS, Utilities Director considers the Floodplain Management Plan to be of the utmost importance to the citizens of The City of Daytona Beach and recommends adoption of the Volusia County Integrated Floodplain Management Plan 2018.

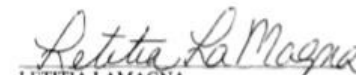
NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DAYTONA BEACH, FLORIDA:

SECTION 1. The Volusia County Integrated Floodplain Management Plan 2018 is hereby adopted. A copy of the Plan is attached hereto and made a part hereof by reference.

SECTION 2. This Resolution shall take effect immediately upon its adoption.


DERRICK L. HENRY
Mayor

ATTEST:


LETTITIA LAMAGNA
City Clerk

Adopted: October 17, 2018

City of Daytona Beach Shores – Resolution of Adoption

RESOLUTION NO. 2018-18

A RESOLUTION OF THE CITY OF DAYTONA BEACH SHORES, VOLUSIA COUNTY, FLORIDA RELATING TO THE 2018 VOLUSIA COUNTY FLOODPLAIN MANAGEMENT PLAN; PROVIDING A SAVINGS PROVISION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Article VIII, Section 2, *Constitution of the State of Florida*, authorizes the City of Daytona Beach Shores to exercise any power for municipal purposes except as otherwise provided by law; and

WHEREAS, coastal and riverine flooding are significant threats to the health and safety of residents of Volusia County and its municipalities; and

WHEREAS, the City of Daytona Beach Shores recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

WHEREAS, City of Daytona Beach Shores has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet CRS certain requirements; and

WHEREAS, in an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

WHEREAS, the adoption of the 2018 Volusia County Floodplain Management Plan, in alignment with the CRS Guidelines, and integration into the Local Mitigation Strategy supports this effort; and

WHEREAS, as adoption of the plan is a requirement of the Community Rating System; and

WHEREAS, the City of Daytona Beach Shores hereby considers the adoption of the 2018 Volusia County Floodplain Management Plan to be of the utmost importance to the citizens of Daytona Beach Shores,

Res. 2018-18
Page 1 of 2

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF DAYTONA BEACH SHORES, FLORIDA, AS FOLLOWS:

SECTION ONE. ADOPTION. The City Council of the City of Daytona Beach Shores hereby accepts and approves of its designated portion of the 2018 Volusia County Floodplain Management Plan. The City Council of the City of Daytona Beach Shores also hereby accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide Plan, and the anticipated schedule for the next updating of the strategy.

SECTION TWO. SAVINGS. The prior actions of the City of Daytona Beach Shores relating to floodplain management are hereby ratified and affirmed.

SECTION THREE: CONFLICTS. All resolutions or parts thereof in conflict with this Resolution are hereby repealed to the extent of such conflict.

SECTION FOUR. SEVERABILITY. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion or application shall be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions thereof.

SECTION FIVE. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

CITY OF DAYTONA BEACH SHORES, FLORIDA

By: 
Mayor Harry Jennings

ATTEST:

By: 
Michael T. Booker, City Manager


Cheri Schwab, City Clerk

APPROVED AS TO FORM AND LEGALITY:

By: 
Lonnie Groot, City Attorney

City of DeBary – Resolution of Adoption

RESOLUTION NO: 2019-03

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DEBARY, FLORIDA IN SUPPORT OF THE 2018 VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

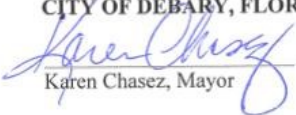
WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, The floodplain management plan has been adopted by Volusia County.

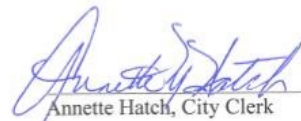
The City of DeBary considers the floodplain management plan to be of utmost importance to Volusia County and the City of DeBary, and supports the floodplain management plan.

ADOPTED the 6th day of February, 2019.

CITY COUNCIL
CITY OF DEBARY, FLORIDA


Karen Chasez, Mayor

ATTEST:


Annette Hatch, City Clerk

City of DeLand – Resolution of Adoption

RESOLUTION NO. 2018 -69

A RESOLUTION OF THE CITY COMMISSION OF DELAND, FLORIDA, ADOPTING THE CITY OF DELAND'S DESIGNATED PORTION RELATING TO THE VOLUSIA INTEGRATED FLOODPLAIN MANAGEMENT PLAN; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, areas of the City of DeLand are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City of DeLand governing body recognizes the importance of developing projects and programs to reduce or eliminate those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, proposed projects and programs have been incorporated into the current edition of the Volusia Integrated Floodplain Management Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF DELAND, FLORIDA:

Section 1. The City of DeLand hereby accepts and approves of its designated portion of the Volusia Integrated Floodplain Management Plan.

Section 2. The City of DeLand accepts and endorses the mitigation goals and objectives established for the countywide plan.

Section 3. The agencies and organizations within the City of DeLand will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the strategy.

Section 4. This Resolution shall become effective immediately upon its adoption

PASSED AND DULY ADOPTED this 5th day of September, 2018.



ATTEST:

Julie A. Hennessy
Julie Hennessy
City Clerk-Auditor

Robert F. Apol
Robert F. Apol
Mayor-Commissioner

APPROVED AS TO FORM AND LEGALITY:

Darren J. Elkind
Darren J. Elkind
City Attorney



City of Deltona – Resolution of Adoption

RESOLUTION NO. 2019-02

A RESOLUTION OF CITY OF DELTONA, FLORIDA; ADOPTING THE VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN AS PART OF THE CITY OF DELTONA LOCAL MITIGATION STRATEGY; PROVIDING FOR CONFLICTS, SEVERABILITY AND AN EFFECTIVE DATE.

WHEREAS, Lacustrine, palustrine, riverine, and other flooding events are significant threats to the health and safety of the citizens of the City of Deltona; and

WHEREAS, the Deltona City Commission recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

WHEREAS, the City of Deltona has been an active participant in "Volusia Prepares", the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the County and other municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

WHEREAS, the City of Deltona participates in the FEMA Community Rating System (CRS) and is interested in maintaining and improving its CRS status; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally subsidized flood insurance within the City of Deltona because the City regulates development in floodplains; and

WHEREAS, the National Flood Insurance Program Community Rating System (CRS) rates various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements; and

WHEREAS, in an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, the City of Deltona is required to adopt the 2018 Volusia County Integrated Floodplain Management Plan as part of the City's the Local Mitigation Strategy; and

WHEREAS, the formal adoption of the Plan by the City is a requirement of the Community Rating System Program.

City of Deltona, Florida
Resolution No. 2019-02
Page 2 of 2

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA:

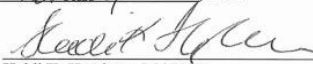
Section 1. The City hereby adopts the 2018 Volusia County Integrated Floodplain Management Plan as part of the City of Deltona Local Mitigation Strategy.

Section 2. Conflicts. All Resolutions or parts of Resolutions insofar as they are inconsistent or in conflict with the provisions of this Resolution are hereby repealed to the extent of any conflict.

Section 3. Severability. In the event any portion of this Resolution is determined to be invalid, illegal or unconstitutional by a court of competent jurisdiction, such decision shall in no manner affect the remaining portion or sections of the Resolution which shall remain in full force and effect.

Section 4. Effective Date. This resolution shall take effect immediately upon its final adoption by the City Commission.

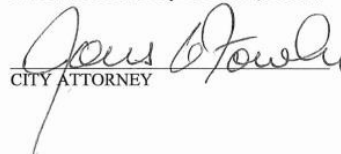
PASSED AND ADOPTED BY THE CITY COMMISSION OF THE CITY OF DELTONA, FLORIDA, THIS 4th DAY OF February, 2019.


Heidi K. Herzberg, MAYOR

ATTEST:


Joyce Raftery, CMC, MMC, CITY CLERK

Approved as to form and legality for use
and reliance of the City of Deltona, Florida:


CITY ATTORNEY

NAME	YES	NO
AVILA-VAZQUEZ	☒	☐
BRADFORD	☒	☐
KING	☒	☐
McFALL	☒	☐
NABICHT	☒	☐
RAMOS	☒	☐
HERZBERG	☒	☐

City of Edgewater - Resolution of Adoption

RESOLUTION #2018-R-12

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EDGEWATER, FLORIDA; IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN", REPEALING RESOLUTIONS IN CONFLICT HERewith; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement; and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines; and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy; and

WHEREAS, The floodplain management plan will be revised in July 2018.

NOW, THEREFORE, be it resolved by the City Council of the City of Edgewater, Florida as follows:

Section 1. The City of Edgewater considers the floodplain management plan to be of utmost importance to Volusia County and the City of Edgewater, and supports the floodplain management plan planning process.

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or applications hereof.

Section 3. All resolutions or parts of resolutions in conflict herewith be and the same are hereby repealed.

Section 4. This resolution shall take effect immediately upon its adoption.

THIS SECTION INTENTIONALLY LEFT BLANK

Section 5. After a motion to approve by Councilman Blazi with second by Councilwoman Power, the vote on this resolution was as follows:

	AYE	NAY
Mayor Michael Ignasiak	✓	—
Councilwoman Christine Power	✓	—
Councilwoman Amy Vogt	✓	—
Councilman Dan Blazi	✓	—
Councilman Gary Conroy	✓	—

PASSED, APPROVED AND ADOPTED this 16th day of July, 2018.

ATTEST:

Robin Matusick
Robin Matusick
City Clerk/Paralegal

**CITY COUNCIL OF THE
CITY OF EDGEWATER, FLORIDA**

By: Michael Ignasiak
Michael Ignasiak
Mayor

For the use and reliance only by the City of Edgewater, Florida. Approved as to form and legality by:
Aaron R. Wolfe, Esquire, City Attorney
Doran, Sims, Wolfe & Ciochetti

Approved by the City Council of the City of Edgewater at a meeting held on this 16th day of July, 2018 under Item # 5j

2018-R-12

2018-R-12

2018-R-12

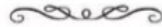
City of Holly Hill – Resolution of Adoption (Page 1 of 2)

Minutes City Commission October 23, 2018

who are violating the city's ordinances to keep their parks free from any unwanted activity.

Mayor Penny opened public participation. No one spoke.

RESULT:	APPROVED AT 1ST READING [UNANIMOUS] Next: 11/13/2018 7:00 PM
MOVER:	Penny Currie, District 2 - Commissioner
SECONDER:	John C. Danio, District 3 - Commissioner
AYES:	Byrnes, Currie, Danio, Via, Penny

2. Resolution

Resolution 2018-R-69 A Resolution of the City Commission of the City of Holly Hill, Florida, Renaming a Portion of 15Th Street to "Whac a Mole Way"; Providing for Conflicting Resolutions; Providing for Severability; and Providing for an Effective Date.

(Requested by Brian Walker, City Planner)

Mr. Forte stated Bob Space Racer's is where Whac-A-Mole is manufactured and it is a well-known arcade game and probably distributed throughout the country, throughout the world. It's a very popular game. Holly Hill is proud to be the home of Bob Space Racer's and the manufacturing of Whac-A-Mole. The city has made national news by recognizing Bob Space Racer's for Whac-A-Mole.

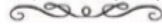
Mayor Penny opened public participation. No one spoke.

Mayor Penny mentioned the text he received from Tony Cassatta and thanked everyone for their support over the years and vote on this and apologized for not being able to attend the meeting.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Arthur J. Byrnes, District 1 - Commissioner
SECONDER:	Chris Via, District 4 - Commissioner
AYES:	Byrnes, Currie, Danio, Via, Penny

RESOLUTION

Enacted and approved this 23rd day of October, 2018, in Holly Hill

3. Resolution

Resolution 2018-R-70 A Resolution of the City Commission of the City of Holly Hill, Florida, Authorizing the City Manager to Accept and Approve Its Designated Portion of the Volusia County Integrated Floodplain Management Plan. Providing for Severability and Providing an Effective Date.

(Requested by Joseph Forte, City Manager)

City of Holly Hill, Florida

Printed: 11/14/2018 11:07 AM

Page 4

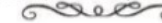
Minutes City Commission October 23, 2018

Mayor Penny opened public participation. No one spoke.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Penny Currie, District 2 - Commissioner
SECONDER:	John C. Danio, District 3 - Commissioner
AYES:	Byrnes, Currie, Danio, Via, Penny

RESOLUTION

Enacted and approved this 23rd day of October, 2018, in Holly Hill



4.

RFQ 18-PW-01 - Professional Surveying Services

(Requested by John McKinney, Finance)

Mayor Penny opened public participation. No one spoke.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Penny Currie, District 2 - Commissioner
SECONDER:	Chris Via, District 4 - Commissioner
AYES:	Byrnes, Currie, Danio, Via, Penny

Enacted and approved this 23rd day of October, 2018, in Holly Hill



5.

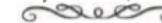
2019 Aquatech B-10 Jet/Vacuum

(Requested by John McKinney, Finance)

Mayor Penny opened public participation. No one spoke.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Arthur J. Byrnes, District 1 - Commissioner
SECONDER:	Penny Currie, District 2 - Commissioner
AYES:	Byrnes, Currie, Danio, Via, Penny

Enacted and approved this 23rd day of October, 2018, in Holly Hill



6.

Capital Lease - 2018 Aquatech B-10 Jet/Vac

(Requested by John McKinney, Finance)

City of Holly Hill, Florida

Printed: 11/14/2018 11:07 AM

Page 5

City of Holly Hill – Resolution of Adoption (Page 2 of 2)



STAFF REPORT
CITY OF HOLLY HILL, FLORIDA

City Commission
Resolution

7.3

MEETING DATE: October 23, 2018
FROM: Joseph Forte
SUBJECT: Resolution 2018-R-70 A Resolution of the City Commission of the City of Holly Hill, Florida, Authorizing the City Manager to Accept and Approve Its Designated Portion of the Volusia County Integrated Floodplain Management Plan. Providing for Severability and Providing an Effective Date.

NUMBER: (ID # 2259)
APPLICANT:
PLANNER:

DISCUSSION:

Holly Hill has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities. Holly Hill representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of Holly Hill to the impacts of future flood events.

The National Flood Insurance Program (NFIP) provides federally subsidized flood insurance in communities that regulate development in floodplains and the National Flood Insurance Program Community Rating System (CRS) rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements.

In an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

The adoption of the 2018 Volusia County Integrated Floodplain Management Plan and integration into the Local Mitigation Strategy supports this effort and the formal adoption of the Plan by the local governing body is a requirement of the Community Rating System Program.

The attached Resolution provides for the City of Holly Hill to accept and approve the designations within the Volusia County Floodplain Management Plan.

FISCAL ANALYSIS:

N/A

STAFF RECOMMENDATION:

Updated: 10/17/2018 3:55 PM

Page 1

Packet Pg. 71

Resolution (ID # 2259)

Meeting of October 23, 2018

7.3

Approve Resolution 2018-R-70.

COMMISSIONGOAL:

Goal #4: Provide proficient public health and safety services in terms of police and fire protection, water, storm water, waste water and solid waste management and disaster preparedness with a focus on intergovernmental collaboration, private sector partnerships, and utilization of technologies and proven innovations.

MOTION:

APPROVE RESOLUTION 2018-R-70, AUTHORIZING THE CITY MANAGER TO ACCEPT AND APPROVE ITS DESIGNATED PORTION OF THE VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN.

Updated: 10/17/2018 3:55 PM

Page 2

Packet Pg. 72



Lake Helen Resolution To Be Added Here



New Smyrna Beach Resolution To Be Added Here

City of Oak Hill – Resolution of Adoption

RESOLUTION 2018-10

A RESOLUTION OF THE CITY OF OAK HILL OF VOLUSIA COUNTY, FLORIDA RELATING TO THE VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN

Whereas, coastal and riverine flooding are significant threats to the health and safety of the citizens of Volusia County and its municipalities; and

Whereas, the Oak Hill City Commission recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community; and

Whereas, Volusia County has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities; and

Whereas, Volusia County's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future flood events; and

Whereas, the National Flood Insurance Program (NFIP) provides federally subsidized flood insurance in communities that regulate development in floodplains; and

Whereas, the National Flood Insurance Program Community Rating System (CRS) rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet Community Rating System Program requirements; and

Whereas, in an effort to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents; and

Whereas, the adoption of the 2013 Volusia County Integrated Floodplain Management Plan and integration into the Local Mitigation Strategy supports this effort; and

Whereas, the formal adoption of the Plan by the local governing body is a requirement of the Community Rating System Program;

Now therefore, be it resolved on this 24th day of September 2018 that,

1] The Oak Hill City Commission hereby accepts and approves of its designated portion of the Volusia County Integrated Floodplain Management Plan,

- 2] The Oak Hill City Commission accepts and endorses the mitigation goals and objectives established by Volusia Prepares for the countywide Plan, and the anticipated schedule for the next updating of the strategy,
- 3] The Oak Hill City Commission finds that the proposed flood mitigation projects and programs included in the Plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the flood mitigation proposals made by the county itself,
- 4] The agency personnel of Volusia County are requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein,
- 5] The agencies and organizations within Volusia County will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the Plan, and
- 6] The Oak Hill City Commission will continue to participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead, and
- 7] The Oak Hill City Commission will further seek to encourage the businesses, industries and community groups operating within Volusia County to also participate in the updating and expansion of the Volusia County Integrated Floodplain Management Plan in the years ahead,

It was moved by Commissioner Bracy and seconded by Vice Mayor Hyatt that said Resolution 2018 - 10, is passed on first reading. A roll call vote of the City Commission on said motion resulted as follows:

Mayor Gibson	<u>YES</u>
Vice Mayor Hyatt	<u>YES</u>
Commissioner Lindlau, Seat #2	<u>YES</u>
Commissioner Bittle, Seat #3	<u>YES</u>
Commissioner Bracy, Seat#4	<u>YES</u>

Passed upon first reading this 24th day of September 2018.



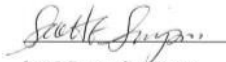
Douglas A Gibson, Mayor

ATTEST:

Kohh Evans

City Clerk/Administrator

Approved as to form and legality for the use and reliance of the City of Oak Hill, Florida, only.



Scott E. Simpson, City Attorney



City of Ormond Beach – Resolution of Adoption

RESOLUTION NO. 2018-137

A RESOLUTION OF THE CITY OF ORMOND BEACH ADOPTING THE 2018 VOLUSIA COUNTY FLOODPLAIN MANAGEMENT PLAN; AND SETTING FORTH AN EFFECTIVE DATE.

WHEREAS, areas of the City of Ormond Beach are vulnerable to coastal and riverine flooding that significantly threaten the safety of residents; and

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) rewards communities that exceed the minimum requirements of the NFIP that help citizens prevent or reduce flood losses; and

WHEREAS, the City of Ormond Beach actively participates in Volusia Prepares, the Local Mitigation Strategy (LMS) working group, and adopted the Volusia County Multi-jurisdictional LMS by Resolution 2005-55 on March 15, 2005; and

WHEREAS, the City of Ormond Beach strengthened the LMS by adopting the 2013 Volusia County Integrated Floodplain Management Plan by Resolution 2013-112 on June 18, 2013; and

WHEREAS, The County of Volusia contracted with the East Central Florida Regional Planning Council (ECFRPC) to complete the required 5-year update of the 2013 Volusia County Integrated Floodplain Management Plan; and

WHEREAS, the City Commission adopted Resolution 2018-90 supporting the planning process to update the 2013 Volusia County Integrated Floodplain Management Plan in compliance with the Community Rating System (CRS) guidelines; and

WHEREAS, the East Central Florida Regional Planning Council has completed the 2018 Volusia County Integrated Floodplain Management Plan (the "Plan") in accordance with the FEMA Community Rating System planning process; and

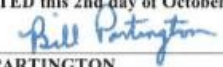
WHEREAS, the City Commission finds the Plan consistent with its goals and objectives in reducing the potential for personal/property losses in flood-prone areas and ensuring the lowest possible flood insurance premiums for residents, now therefore,

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF ORMOND BEACH, FLORIDA, THAT:

SECTION ONE. The City Commission hereby accepts the Plan attached hereto as Exhibit "A", approves those designated parts of the Plan pertaining to laws within the City, and hereby adopts the same as the official Floodplain Management Plan.

SECTION TWO. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED this 2nd day of October, 2018.


BILL PARTINGTON
 Mayor

ATTEST:


LISA DAHME
 City Clerk

-1-

S:\LEGAL\CITY COMMISSION\ITEMS\RESOLUTION\2018\10-02-18\18-137AR -
 VC INTEGRATED FMP ADOPT UPDATED 3 YEAR PLAN P18-00010
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-2-

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 VC INTEGRATED FMP ADOPT UPDATED 3 YEAR PLAN P18-00010
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City of Pierson – Resolution of Adoption

RESOLUTION NO. 2018-12

**A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF PIERSON, FLORIDA
IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE
REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT
PLAN"**

WHEREAS, Coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities: and,

WHEREAS, The National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains: and

WHEREAS, The Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement: and

WHEREAS, In an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines: and

WHEREAS, The East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy: and

WHEREAS, The floodplain management plan will be revised in July 2018.

The Town of Pierson considers the floodplain management plan to be of utmost importance to Volusia County and the Town of Pierson and supports the floodplain management plan.

The within and foregoing Resolution No. **2018-12** was read before the Town Council of the Town of Pierson, Florida at its meeting held at Pierson Town Hall, on the **24th day of July 2018**

It was moved by Council Member **Herbert Bennett** and seconded by Vice Chair **James Peterson** that said Resolution be duly adopted.

A roll call vote of the Council on said motion resulted as follows:

Samuel G.S. Bennett, Chairman	<u> AYE </u>
James T. Peterson, Vice Chairman	<u> AYE </u>
Herbert J. Bennett, Council Member	<u> AYE </u>
Robert F. Greenlund, Council Member	<u> AYE </u>
Thomas R. Larrivee, Council Member	<u> AYE </u>

Be it finally resolved that this Resolution No. **2018-12** shall be made a part of the permanent records of the Town of Pierson, Florida.

ATTEST:


Carmen M. Spelorzi, Town Clerk


Samuel G.S. Bennett, Chairman

Town of Ponce Inlet – Resolution of Adoption

RESOLUTION 2018-10

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF PONCE INLET, FLORIDA IN SUPPORT OF THE PLANNING PROCESS FOR THE DEVELOPMENT OF THE REVISED "VOLUSIA COUNTY & MUNICIPAL FLOODPLAIN MANAGEMENT PLAN"

WHEREAS, coastal and riverine flooding are significant threats to the safety of residents of Volusia County and its municipalities; and,

WHEREAS, the National Flood Insurance Program (NFIP) provides federally supported flood insurance in communities that regulate development in floodplains; and

WHEREAS, the Community Rating System (CRS) grades the various community floodplain management programs and reduces flood insurance premiums in those communities that meet certain requirement; and

WHEREAS, in an effort to reduce the potential for personal/property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents, Volusia County has contracted with East Central Florida Regional Planning Council to draft the revised floodplain management plan in alignment with CRS guidelines; and

WHEREAS, the East Central Florida Regional Planning Council is also required to integrate the floodplain management plan into the local mitigation strategy; and

WHEREAS, the floodplain management plan will be revised in August 2018.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF PONCE INLET, FLORIDA AS FOLLOWS:

SECTION 1: The Town of Ponce Inlet considers the floodplain management plan to be of utmost importance to Volusia County and the Town of Ponce Inlet and supports the floodplain management plan planning process.

SECTION 2. This Resolution shall take effect immediately upon its adoption.

It was moved by Councilmember Paritsky and seconded by Vice-Mayor Hoss that said Resolution be passed. A roll call vote of the Town Council on said motion resulted as follows:

Mayor Smith, Seat #1	Yes
Councilmember Milano, Seat #2	Excused Absent
Vice-Mayor Hoss, Seat #3	Yes
Councilmember Perrone, Seat #4	Yes
Councilmember Paritsky, Seat #5	Yes

Adopted this 23rd day of August, 2018.

Resolution 2018-10
Page 1 of 2



ATTEST:

Jeanne Witt
Jeanne Witt, CMC
Town Manager/Town Clerk

Town of Ponce Inlet, Florida

Gary L. Smith
Gary L. Smith, Mayor

Resolution 2018-10
Page 2 of 2

City of Port Orange – Resolution of Adoption

RESOLUTION NO. 18-52

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA; ADOPTING THE CITY OF PORT ORANGE'S DESIGNATED PORTION RELATING TO THE "VOLUSIA COUNTY INTEGRATED FLOODPLAIN MANAGEMENT PLAN"; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of Port Orange are vulnerable to the human and economic costs of natural, technological, and societal disasters; and,

WHEREAS, the City of Port Orange's governing body recognizes the importance of developing projects and programs to reduce or eliminate those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, proposed projects and programs have been incorporated into the current version of the Volusia County Integrated Floodplain Management Plan that has been prepared and issued for consideration and implementation by the communities and jurisdictions of Volusia County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The City of Port Orange hereby accepts and approves of its designated portion of the Volusia County Integrated Floodplain Management Plan, attached hereto as **Exhibit "A"**.

(RESO. NO. 18-52)

Section 2. The City of Port Orange accepts and endorses the mitigation goals and objectives established for the county-wide plan.

Section 3. The agencies and organizations within the City of Port Orange will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the City's individual section of the strategy.

Section 4: The Resolution shall become effective immediately upon its adoption.


MAYOR DONALD O. BURNETTE

ATTEST:


Robin L. Fenwick, CMC City Clerk

Adopted on the 13 day of November, 2018

Reviewed and Approved: 
Margaret T. Roberts, City Attorney

EXHIBIT "A"

A COMPLETE COPY OF
THE 2018 VOLUSIA COUNTY INTEGRATED
FLOODPLAIN MANAGEMENT PLAN
is available in the Office of the City Clerk:

Robin L. Fenwick, CMC, City Clerk
1000 City Center Circle
Port Orange, FL 32129
(386) 506-5563

City of South Daytona – Resolution of Adoption (page 1 of 2)

RESOLUTION NO. 18-24

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, FLORIDA, AUTHORIZING THE ADOPTION OF THE 2018 UPDATE TO THE CITY OF SOUTH DAYTONA ANNUAL PROGRESS REPORT FOR THE CITY'S FLOODPLAIN MANAGEMENT PLAN; PROVIDING FOR CONFLICTING RESOLUTIONS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, areas of the City of South Daytona are vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City of South Daytona governing body realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of South Daytona has been an active participant in Volusia Prepares, the Local Mitigation Strategy working group, which has established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, to eliminate or decrease these vulnerabilities, and

WHEREAS, the City of South Daytona representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of areas of South Daytona to impacts of future disasters, and

WHEREAS, the City of South Daytona updates its Floodplain Management Plan annually to include the status of projects and programs to mitigate flooding, and

WHEREAS, the City of South Daytona Floodplain Management Plan is incorporated into the Five-Year Countywide Local Mitigation Strategy Plan that was updated and approved in 2015.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SOUTH DAYTONA, VOLUSIA COUNTY, FLORIDA:

Section 1. Description of Actions. The City Council of the City of South Daytona approves the updated Annual Progress Report for the City's Floodplain Management Plan.

Section 2. Repealer. All prior resolutions, if any, which conflict with this resolution are hereby repealed.

Section 3. Severability. If any section, subsection, sentence, clause, phrase or portion of this resolution, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or application hereof.

Section 4. Effective Date. This resolution shall become effective immediately upon its adoption.

APPROVED AND ADOPTED upon first and final reading at the regular meeting by the City Council of the City of South Daytona, Florida, on the 10 day of September, 2018.

SIGNED:

William C. Hall, Mayor

ATTEST:

Joseph W. Yarbrough
City Manager

CERTIFIED AS TO FORM:

Scott Simpson
City Attorney

ATTACHMENT "A"

**City of South Daytona Floodplain Management Plan
Annual Progress Report (2018)**

1.) Floodplain Management Plan Implementation Update/Status

The City has accomplished or is continuously striving to achieve each of the City's mitigation initiatives. The City of South Daytona Floodplain Management Plan was incorporated into the Volusia County Integrated Management Plan by Resolution and the annual progress report update. An electronic copy of the Volusia County Integrated Floodplain Management Plan 2015 Update and the City of South Daytona Floodplain Management Plan and Action Plan is available for review at the County of Volusia website: <http://www.volusia.org/services/public-protection/emergency-management/>. The City of South Daytona 2017 Annual Progress Report is available for review at the City of South Daytona's website: <http://www.southdaytona.org/departments/division.php?structureid=29>.

Goal – To protect human life and health through preparedness of emergency response teams from the Fire, Police and Public Works Departments.

Status – The City has prepared and updates the South Daytona Disaster/Recovery Plan as needed. The plan outlines interdepartmental coordination for a unified response to disasters including flooding events. The Fire Department, Police, Public Works and the Community Development Department play vital roles in the implementation of any emergency response.

Goal – Provide leadership in protecting residential properties from the impacts of floods by coordinating historical data with updated storm water management studies to identify possible flooding concerns.

Status – The City Council and City Manager are dedicated to the protection of the community from flooding issues. South Daytona is a coastal community with an average ground elevation of about 6.0' above sea level. This geographical feature dictates the need to be active, aggressive and responsive to the community needs for flood protection.

Goal – To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public with proper planning and cost effective storm water improvements.

Status – The City is continuously assessing the Stormwater Infrastructure and making necessary improvements as needed. South Daytona implemented a Stormwater Utility Fee to fund projects and has spent over \$30,000,000 in the past 20 years on stormwater related projects.

Goal – To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains through hardening facilities and Public Works Department preparedness.

Status – Public Works, in conjunction with other utility and service providers work together to maintain in proper condition, replace when needed, and harden when necessary, all utilities, streets and bridges within the City.

Page 2 of 4

City of South Daytona – Resolution of Adoption (Page 2 of 2)

Goal – To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blighted areas.

Status – An integral part of a stable tax base for sound development is adhering to sound development codes and stormwater protection. South Daytona has in place a very strict development code that exceeds the minimum requirements set forth in the Florida Building Code and the Community Rating System Program.

Goal – Provide advice to property owners by the Floodplain Manager and Chief Building Official, concerning the protection of their properties from flooding.

Status – This service is provided on request by both the Floodplain Manager and Chief Building Official and has been an invaluable outreach program to assist homeowners and business owners with their localized drainage issues.

Goal – Maintain a Public awareness program that informs all property owners in the flood zones that are located in a flood zone through mail-outs and website.

Status – City staff continues to mail letters annually to homeowners of repetitive loss structures and those located in the SFHA regarding their location/status of their flood zone. The City website also provides many different documents and links for Public Awareness.

Goal – Maintain an aggressive grant program to identify and obtain funding for both pre- and post-disaster mitigation projects through the Community Development and the Redevelopment Departments.

Status – City staff continues to apply for grants and most recently was awarded over \$200,000 for a stormwater improvement project to reduce flooding in the Lantern Park Subdivision. The project includes building a stormwater pond for retention of run-off and reduction of flooding. The City has received over 30 million dollars over the past 40 years for mitigation and stormwater that have significantly reduced the number of structures that could flood during storm events.

NEW Status: The City was awarded over \$300,000 in grant funds for a stormwater project to reduce flooding in the Jones Street neighborhood. The project includes a stormwater pond for retention of run-off and reduction of flooding and was completed in the spring of 2017.

Goal – Create programs to manage the surface water runoff through maintaining an updated stormwater management plan through the Public Works Department in conjunction with the Floodplain Manager and Chief Building Official.

Status – South Daytona has a Master Drainage Plan that is updated regularly with field collected data from Public Works after major storm events. Improvements are designed for areas with reoccurring flooding issues.

2.) Failure to meet objectives or implement goals/initiatives.

N/A – The City of South Daytona meets their objectives or implements goals/initiatives as provided for in the plan.

3.) New projects and recommendations.

Page 3 of 4

New Mitigation Projects:

VOL – 0471 Windle Lane Stormwater Project

This project includes the purchase of a 2.26 acre vacant lot adjacent to the two existing stormwater ponds. The existing ponds are located on 1.37 acres and serve two phases of the Coventry Forest Subdivision. The acquired 2.26 acre lot will be excavated along with the other two existing ponds to make one large wet detention system. This larger system will have a pumping station to aid in recovery efforts during and after major storm events thereby allowing better ingress/egress for our emergency services vehicles. The project also includes an outfall structure designed to stop tail water from Reed Canal backing up into the proposed pond system. Funding of the project includes FEMA - \$262,500, DEP - \$50,000 and the City is applying for additional funds in 2019 through SJRWMD.

VOL – 0552 – South Daytona SRL Reconstruction Project 1

2411 S. Palmetto Avenue, Severe Repetitive Loss Structure, Demolition and Reconstruction of Home.

Past LMS Projects and Status:

VOL-0389 – South Daytona EOC/Public Works Facility, Design underway; no funding to date.

VOL-0210 – Country Club Manor Subdivision, Design underway; no funding to date.

VOL-0246 – Reed Canal Reconstruction Design, Design underway; no funding to date.

VOL-0244 – Golfview Subdivision Retrofit – Phase V Stormwater, Completed 2008.

VOL-0245 – Lantern Park Retrofit – Phase V Stormwater, Completed in 2016.

VOL-0247 – Western Road Stormwater Improvements, Completed 2006.

VOL-0248 – Greenbriar Subdivision Retrofit Completed 2012.

VOL-0378 – Stevens Canal Outflow Pond Completed 2010.

VOL-0395 Reed Canal Stormwater Treatment Facility Completed 2012.

VOL-0453 Lantern Subdivision Retention Pond Completed in 2016.

VOL-0469 Jones Street Stormwater Project Completed in 2017.

Page 4 of 4

Volusia County – Resolution of Adoption

RESOLUTION 2018- 121**A RESOLUTION OF THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA ADOPTING THE VOLUSIA COUNTYWIDE INTEGRATED FLOODPLAIN MANAGEMENT PLAN; AND PROVIDING FOR AN EFFECTIVE DATE.**

WHEREAS, coastal and riverine flooding are significant threats to the health and safety of the citizens of Volusia County and its municipalities;

WHEREAS, the Volusia County Council recognizes the importance of reducing vulnerabilities to flood events for the overall good and welfare of the community;

WHEREAS, Volusia County has been an active participant in "Volusia Prepares," the local mitigation strategy working group that established a comprehensive, coordinated planning process involving the county and its municipalities, as well as other public and private sector organizations, in order to eliminate or decrease these vulnerabilities;

WHEREAS, Volusia County's representatives and staff have identified, justified and prioritized a number of proposed projects and programs needed to mitigate the vulnerabilities of unincorporated areas of Volusia County to the impacts of future flood events;

WHEREAS, the National Flood Insurance Program ("NFIP") provides federally subsidized flood insurance in communities that regulate development in floodplains;

WHEREAS, the NFIP community rating system ("CRS") rates the various community floodplain management programs and reduces flood insurance premiums in those communities that meet CRS requirements;

WHEREAS, efforts to reduce the potential for personal and property losses in flood-prone areas and ensure the lowest possible flood insurance premiums for residents are in the interest of the residents of Volusia County;

WHEREAS, the adoption of the 2018 Volusia County Integrated Floodplain Management Plan (the "Plan") and integration of it into the local mitigation strategy supports this effort; and

WHEREAS, the formal adoption of the Plan by the local governing body is a requirement of the CRS program.

BE IT RESOLVED BY THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA, IN OPEN MEETING DULY ASSEMBLED IN THE THOMAS C. KELLY ADMINISTRATION CENTER, DELAND, FLORIDA THIS 18TH DAY OF SEPTEMBER, 2018, AS FOLLOWS:

SECTION 1. The Volusia County Council hereby accepts, approves and adopts the "Volusia County Integrated Floodplain Management Plan" as the Plan pertains to unincorporated Volusia County.

Page 1 of 2
Resolution 2018- 121

SECTION 2. The Volusia County Council accepts and endorses the mitigation goals and objectives established by "Volusia Prepares" for the countywide Plan, and the anticipated schedule set forth on page 46 of the Plan for the next updating of the strategy.

SECTION 3. The Volusia County Council finds that the proposed flood mitigation projects and programs included in the Plan by other jurisdictions and organizations are acceptable, that they will not adversely affect the county or its neighborhoods, and that they do not conflict with or duplicate the flood mitigation proposals made by the county itself.

SECTION 4. Volusia County will make reasonable efforts to pursue available funding opportunities for implementation of the proposals designated in the Plan.

SECTION 5. The agencies and organizations within Volusia County will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in the county's individual section of the Plan.

SECTION 6. The Volusia County Council intends to continue to participate in the updating and expansion of the Plan in the years ahead.

SECTION 7. The Volusia County Council will further seek to encourage the businesses, industries and community groups operating within Volusia County to participate in the updating and expansion of the Plan in the years ahead.

SECTION 8. EFFECTIVE DATE. This resolution shall take effect immediately upon its adoption.

DONE AND ORDERED IN OPEN MEETING.

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA

ATTEST: 
George Recktenwald
Interim County Manager

BY: 
Ed Kelley
County Chair



Page 2 of 2
Resolution 2018-121



APPENDIX J: CONSEQUENCES BY HAZARD

The consequences by hazard can be found on the following pages of this report. Within this section, environmental, economic and societal issues associated with each hazard covered in this report are identified.

RISK and VULNERABILITY (4.3.1)		People	Property	Environment	Program Operations
HAZARD/HIRA					
Natural					
Hurricanes/Tropical Storms		According to the Volusia County Property Appraiser, over 45% of the County's population resides along the coast (205,000 people). The coastal region also leads the County in tourism. The large coastal population is highly vulnerable to the affects of a hurricane. Volusia County's worst hurricane season was 2004. Hurricanes Charley, Frances and Jeanne impacted Volusia County, back-to-back. Although Charley was the only storm to impact the County with hurricane-force winds, never-the-less these storms had a major impact on homes and infrastructure, and caused adverse human consequences. (Section V)	Volusia County's worst hurricanes on record were Hurricanes Charley, Frances and Jeanne in 2004. These back-to-back storms battered Volusia County with tropical storm force winds for weeks. Storms of this magnitude have the potential to destroy homes and infrastructure, injure and kill people in its path, and cause massive environmental consequences. Cumulatively the County experienced over \$560,000,000 in damages. Approximately 40% of homes were damaged. Based on the hazard analysis, Volusia County's annualized losses to residential buildings from Hurricanes is over \$280 million. For non-residential buildings, annualized losses total almost \$70 million. (Section V and VI)	Hurricanes do not only bring high winds to Volusia County, they also have the potential to produce inland flooding, tornadoes, storm surge, and significant beach erosion. These four hazards can severely impact the environment by downing trees, eroding sensitive coastal dunes and ecosystems, loss of sea turtle nests, and causing the runoff of debris and potentially hazardous materials into our waterways. Because erosion events were part of other hazard events (e.g., storm surge, hurricane, severe winter storm) the monetary damage for the erosion alone is unknown.	Program operations may be impacted by a hurricane. Historically, tropical depressions or tropical storms have not impacted the County's ability to perform its day-to-day program or CEOC operations. Preparedness, response, and recovery efforts have been implemented with no additional strain to the County. In the case of a direct land-falling hurricane in Volusia County, program operations may become strained, especially if it is a major hurricane (Cat or greater). In these situations we will rely on assistance from other counties through the Emergency Management Assistance Compact (EMAC) (mutual aid) or through the State or FEMA. In some cases, it may take several weeks or months to return program operations to normal level. (VC CEMP)
Floods		According to FEMA, flooding is the most costly natural hazard in the U.S. and can cause long-term adverse psychological impacts. According to FloodSmart.gov, all 50 states are at risk to flooding and flash floods. Flash floods are particularly dangerous because they can quickly sweep cars off roadways, causing injuries and casualties to people in its path. (Volusia County does not experience true "flash flooding"). In addition to life safety, property can be damaged by just an inch of water (FloodSmart.gov). Homeowners insurance and renter's insurance does not cover flooding. A separate policy under the NFIP must be purchased. Citizens without flood insurance may not receive any assistance to repair their homes and property following an event. Countywide, there are 47,452 structures in the 100-year floodplain. For a map the 100-year floodplain, see Figure 5.10.	Property in low-lying areas or Special Flood Hazard Areas (100 year floodplain) are susceptible to damage from flooding (FloodSmart). Floods can destroy homes and businesses, erode property along creeks and rivers, and washout roads and bridges. In some cases, flooding is a secondary hazard from a hurricane event. Volusia County has experienced ten major flood events since 1994 resulting in over \$35,000,000 in insured flood losses. (Section V)	Flooding has the potential to put our environment at risk in different ways. Flooding erodes our river beds which causes sediments to enter the waterways, potentially clogging our stormwater systems. Floods can also bring hazardous materials/pollution into our waterways via runoff. The County's sensitive riparian ecosystems are often negatively impacted in this process. When Lake Okeechobee nears flood level, water is emptied directly into the intracoastal waterway. This water, rich in nutrients, results in algae blooms and oxygen depletion in our rivers, resulting in fish die-offs. Due to a lack of data on historical environmental impacts from flooding in Volusia County, we were unable to directly calculate the full cost.	In rare occasions, program operations may be impacted by a flood. The VCEOC does not sit a Special Flood Hazard Area (SFHA), although much of the surrounding land, roadways, and access points do. Historically, the EOC has remained operational during flood events with impact to program operations. County programs may become strained responding to local statewide flooding events. In these situations we may rely on assistance from other county and the state through the Emergency Management Assistance Compact (EMAC) and mutual aid agreements.
Thunderstorms		Severe thunderstorms are a common occurrence in Volusia County throughout the year. These are dangerous events capable of producing high winds, hail, tornadoes, and lightning. All citizens in Volusia County are at risk to the negative effects of thunderstorms. Downed trees, damage to homes, loss of electricity, and rarely, casualties are common byproducts of severe thunderstorms. (Section V and VI)	According to NOAA's Climatic Data Center, from 1996 - 2013, Volusia County had 120 severe thunderstorm/wind events, causing approximately \$142 million in property damage with zero fatalities. All property in Volusia County is at risk to the negative effects of thunderstorms. Downed trees, damage to homes, businesses, and infrastructure, and loss of electricity are common byproducts of severe thunderstorms. (Section V and VI)	Severe thunderstorms in Volusia County have historically had a minimal impact on the environment. In some cases, these storms can down trees and vegetation and cause localized flooding. Please see "Floods" above.	There is no risk to program operations from thunderstorms. VCEM's ability to respond to a manage the event should not be impacted. The VCEOC is equipped with two generators a redundant communication systems. In a catastrophic event, the VCEM may rely on outside support to maintain operations as stated in the above hazard examples.
Tornadoes		Tornadoes pose a great risk to people and structures. While Volusia County is not located in "tornado alley", people are at risk to the impacts of a tornado. From 1953 to 2009, Volusia County had 69 tornado events, responsible for 2 deaths and 107 injuries. (table 5.12) Not only can tornadoes threaten life safety, they can demolish homes and businesses, destroy infrastructure, and impact entire communities.	Tornadoes pose a great risk to property. From 1996 to 2013, Volusia County had 37 tornado events, responsible for over \$142,000,000 in property damage. Two fatalities and 128 injuries were reported. (Section V, NOAA Climatic Data Center) Tornadoes can reach wind speeds over 200mph, (although the most powerful tornado to impact Volusia County was an EF3) lifting homes and businesses off of their foundations, crippling infrastructure and creating automobile sized missiles. Entire communities may be destroyed.	Because of the vast range of wind speeds associated with tornadoes, the environment is at risk to a variety of impacts. Even an EF0 (65-85mph) can uproot trees and vegetation. In stronger tornadoes, debris will tossed miles away from the source, potentially entering our waterways. Hazardous materials may escape if vehicles are damaged or storage tanks are compromised.	Unless there is a direct impact from a tornado, there is no risk to program operations at the County level. Preparedness, response, and recovery efforts should not be impeded. The VCEOC would remain operational, supporting the local officials. In the case of a direct hit the VCEOC, program operations would be minimally affected, as the building is hardened withstand an EF-4 tornado.
Wildfire		Wildfires are one of the most common hazard events in Volusia County. Between 2000 - 2008, the average number of wildfires per year was 129 (Table 5.18). People and their property are at risk to the impacts of a wildfire. Wildfires can burn down trees, vegetation, homes and businesses. Smoke from wildfires can be detrimental to the health of citizens living in close proximity to the fires. Smoke and ash from wildfires can obscure vision and cause extended road closures.	Wildfires can destroy public and private property, ravish parklands, and disrupt the service of critical utilities. The most recorded wildfires in a 2-month period in Volusia County was 233 fires between June and July 1998; 163,000 acres burned. The fires threatened 29,000 homes, \$60,000,000 in timber was lost, and \$2,100,000 in property damage resulted. Both forested and urban areas are at risk to wildfires. (Section V and VI)	Though many wildfires are a natural process, the environment may be negatively impacted. Wildfires can start in urban or woodland areas. The national average size of a wildfire is 309.6 acres (NOAA Wildfire Report 2012). Not only are trees impacted by these fires, so are the native species of plants and animals. Smoke and ash from the fires can pollute waterways and the air.	There is a minimal risk to program operations posed by wildfires. Historically, the VCEOC has been impacted by a wildfire on two occasions, however the smoke intrusion was never severe enough to require COOP activation. If there was a wildfire at or near the VCEOC that caused air pollution or blocked access roads to the facility, program operations may become strained in this situation, VCEM may activate our COOP Plan. In extreme circumstances, the VCEOC may seek outside help through mutual aid agreements and EMAC.
Drought/ Extreme Heat		People are indirectly at risk to drought. Drought negatively affects agriculture and livestock, which impacts the food people eat. Farmers are the most directly impacted by the impacts of drought. Extreme heat is one of the leading causes of natural hazard deaths in the United States (International Journal of Health Geographics).	Property may be at high risk to drought under extreme circumstances. Extended periods of drought impacts agricultural products and farmlands. Crop losses may be significant. The fern industry may be adversely impacted. Volusia County experienced droughts in 1981, 1985, 1998, 1999, and 2000. (Section V and VI)	The environment is also at risk to drought and extreme heat. Without water, vegetation and sensitive ecosystems may be negatively impacted. Stream flows may be reduced, impacting riparian and riverine ecosystems. (Section V)	Program operations will not be impacted by drought conditions.
Hail		Everyone in Volusia County is at risk to hail. Hail can cause injuries and, in rare cases, death if people are outside during an extreme hail event. In Volusia County there have been no recorded fatalities or injuries reported from hail. (Section V) Hail is more harmful to homes and businesses as it can damage roofs and windows on buildings and vehicles.	Although hail storms do not typically cause widespread damage to property, if the size of the hailstones are great enough, hail can puncture roofs, break car windshields, dent bodywork, and damage windows. Total losses from the 78 hail events from 1996 - 2013 in Volusia County is over \$110,000. (Table 5.3). Because hail is formed during thunderstorms, see "Thunderstorms" for more information.	Although the entire County and environment is vulnerable to hail, there are no direct significant impacts to the environment. An example of an indirect impact may be vehicular accidents on roadways that leak gasoline and hazardous materials into roadways.	Program operations will not be impacted directly by hail. Because hail is formed during thunderstorms, see "Thunderstorms" for more information.
Sea Level Rise		Coastal areas and low-lying river-adjacent areas are susceptible to sea level rise. Often times, these areas are highly populated. Sea level rise is a long term hazard and short term loss of life is not a likely outcome.	Property adjacent to the Atlantic Ocean, Indian River Lagoon, Halifax River and the St. Johns River are at risk for sea level rise. Impacts to property in Volusia County are expected to begin in the 2040 to 2070 time frame.	Sea level rise can inundate structures over the long term, posing an environmental risk if these facilities carry hazardous materials. Sea level rise is also projected to deteriorate coastal systems such as dunes.	Volusia County took part in the East Central Florida Regional Resiliency Action Plan, the East Central Florida Regional Resilience Collaborative, and other internal sea level rise studies. Sustainability of program operations was analyzed as part of these efforts.
NOAA Climatic Data Center	http://www.ncdc.noaa.gov/				

RISK and VULNERABILITY (4.3.1) (con't)		People	Property	Environment	Program Operations
HAZARD/HIRA					
Natural (Cont'd)					
Severe Winter Storms	All of Volusia County is vulnerable to winter storms. Being in the southern portion of the nation, we rarely experience severe winter storm events, however there were two extended cold periods in the 1980's that froze many of the orange groves. (Section V) NOAA's Climactic Data Center has recorded 0 severe winter storms from 1996 - 2009. Historically the greatest impact of cold weather has been on the homeless population. Shelters have been opened during cold weather events for them.	All of Volusia County is vulnerable to winter storms. The greatest impact was to the orange groves and fern industry in the 80's. The fern industry was also impacted. No dollar amount of damage is available.	The environment is at risk to the negative effects of winter weather. Freezing temperatures can hurt crops and vegetation, particularly non-native species.	Program operations will not be impacted by winter weather.	
Lightning	Everyone in Volusia County is at risk to lightning, as Florida is the lightning capital of the U.S. Lightning can cause serious personal injuries and, in some cases, death. Since 1994, lightning has caused 1 death and five injuries. (Section V) Lightning is also harmful to homes and businesses, potentially sparking fires or destroying an electrical system. Beach goers, boaters, and golfers are at particular risk to lightning.	All of Volusia County is at risk to lightning. Lightning has caused over \$1,367,000 in property damage since 1996. (Table 5.8, NOAA Climactic Data Center) Lightning is responsible for causing numerous structure fires and wildfires in Volusia County, particularly during our dry season in the later winter/early spring.	The environment is vulnerable to lightning strikes. Lightning can spark fires, and if conditions are dry enough, lightning can spark a serious wildfire (Section V). See "Thunderstorms" and "Wildfires" for more information.	Program operations will not be impacted directly by lightning. If VCI directly hit by lightning, we have redundant power, IT, and communication systems in place.	
Coastal Erosion	Although there is no life-safety issue with coastal erosion, people living on the coastline of Volusia County are at risk to this hazard type. Because coastal erosion can be a result of tropical storms, hurricanes, and nor'easters, homes and structures built along the coastline may be damaged in a hurricane event. Homes may fall into the ocean and protective dunes may be destroyed.	All property along the coast of Volusia County is at risk to coastal erosion. Private properties in some areas lose inches or feet of beach each year to eroding coastlines. Coastal erosion has caused over \$400,000,000 in damages. (Table 5.13) For a map of critical erosion areas, see Figure 5.8.	The environment is extremely vulnerable to coastal erosion. Erosion can occur via wind or water. Erosion of soil and sand can lead to sedimentation in waterways, loss of habitat for coastal ecosystems, and changes in the coastal geomorphology. (Section V)	Program operations are not at risk to coastal erosion. The VCEOC located 20 miles inland from the coast.	
Sinkhole	Sinkholes are a natural and common geologic feature in areas with underlying limestone and other porous rock types that are soluble in water. There were 80 sinkholes in Volusia County between 1973 and 2005. (Table 5.12) People are at risk to sinkholes should the structure or car they are in be impacted by a sinkhole suddenly opening. No injuries from sinkholes have been recorded in Volusia County.	Property is at risk to sudden sinkhole formation, particularly in west Volusia County. In 2004, a sinkhole devoured a 160 foot section of Howland Boulevard in Deltona. It is estimated it took 1 million cubic yards of dirt to fill it.	The most important environmental issue with respect to sinkholes is the sensitivity of aquifers to groundwater contamination. The effect of man on sinkholes is most severe in cases where polluted surface waters enter sinkhole aquifers. Since they are natural holes, they are attractive sites for the dumping of trash and HAZMAT.	There are no risk to program operations from sinkhole formation.	
Tsunami	The residents of the coastal region of Volusia County are at risk to a tsunami. In August 2008, a qualitative tsunami hazard assessment indicated that the U.S. Atlantic coast has a very low Tsunami risk based on low wave run-up, low tsunami hazard frequency, and no reported fatalities. That said, a tsunami event could potentially impact a significant portion of the coastal population. Fortunately there should be a minimum six hours advance notice, sufficient time to evacuate the vulnerable population.	Should a tsunami event impact Volusia County, severe or catastrophic damage could occur. Massive amounts of vegetative and construction debris would result, boats would be washed inland, power lines could collapse, and underground utilities could be destroyed. (Section V)	A tsunami event could be environmentally devastating. Vegetation in large stretches of the coast would be hurt substantially as saltwater-tolerant mangroves and grasses take over from other species. For rare animals with specific reproduction sites, like marine turtles, the tsunami's effects could spell extinction. Salt water intrusion into aquifers would occur. Sewage and other pollutants would contaminate ground water.	Program operations may be impacted by a tsunami. Although Volusia County has never experienced a tsunami, VCEM developed a tsunami response plan that indicated response and recovery efforts may be strained. We will rely on assistance from other counties through mutual aid, the State and FEMA. It may take months to return program operations to a normal level.	
Storm Surge	Storm surge occurs when the water level of a tidally influenced body of water increases above the normal astronomical high tide and is associated with tropical storms and hurricanes. Storm surge is the biggest threat to people associated with a tropical cyclone. It is critical for those living in storm surge zones to evacuate when ordered to do so.	All of Volusia County's 48 miles of coastline are vulnerable to storm surge. (Figure 5.11) Billions of dollars of property are located in storm surge zones. The State of Florida has established a Coastal Construction Control Line (CCCL). To minimize property damage, no structures may be built seaward of this line. During several previous storm surge events, some parts of SR A1A were undermined.	Storm surge can be extremely detrimental to the environment, destroying turtle nesting sites, inundating coastal areas and rivers with saltwater, polluting ground water, and killing sensitive vegetative ecosystems.	Program operations may be impacted by a large storm surge event (Category 3 or higher hurricane). Although Volusia County has never experienced a large storm surge event, we have experienced many large scale storm surge events that caused homes to flood and moderate coastal erosion. Some routine program operations were suspended the VCEOC returned to a Level 3 (monitoring) status.	
Public Health Emergencies	All Volusia County residents are at risk to public health emergencies such as a pandemic influenza, pneumonic plague, epidemic, food contamination, etc. The very young and the very old are especially vulnerable as their immune systems are fragile. Public health emergencies may be accidental, natural, or intentional. Several cases of dengue fever (DEN-1) have been reported in Martin County. None have been reported in Volusia County to date. Volusia County has experienced cases of imported malaria. Although rare, there have been cases of west Nile virus encephalitis in Volusia County. Fortunately WNV is asymptomatic in 80% of the cases.*	Property is not directly at risk to public health emergencies. In rare instances, agriculture may be the source of a deadly bacteria or virus that can spread to consumers.	The environment is likely not to be impacted by a public health emergency unless it is terrorism or HAZMAT related. See HAZMAT/terrorism sections for more information.	Program operations may be impacted by a public health emergency. Historically, influenza and other public health emergencies have not impacted the County's ability to perform its day-to-day program. VCEOC operations. In the event that numerous VCEOC members were impacted by the event, a reduced staff may be used to operate the Virtual communications from home offices may be required if the situation escalated. In these situations, the VCEOC may rely on assistance from other counties through EMAC. In some cases, it may take several months to return program operations to a normal level.	
Citation	*www.floridahealth.gov				

RISK and VULNERABILITY (4.3.1) (con't)		People	Property	Environment	Program Operations
HAZARD/HIRA					
Human-Caused or Technological					
Cyber Attack		A successful cyber attack at the local level may negatively impact the public's ability to conduct business with the County. It's possible that they would be unable to pay utility or tax bills online. On a national scale, increased online control of critical infrastructure means greater vulnerability of electrical power grids, water and transportation systems, oil pipelines, refineries and power-generation plants.	Property is not at risk from a cyber attack.	The environment is not at risk from a cyber attack.	Should a cyber attack take down the County internet/intranet system, emergency management programmatic activities may experience a minor impact. Cyber infrastructure enables storage and transfer of massive amounts of knowledge to enable planning, resource allocation, personnel deployment, and coordination of emergency situations. The Volusia County Information Technology Department would activate its COOP in this situation.
Civil Disturbance		The public may be negatively impacted by a civil disturbance. If a civil disturbance were to occur during a major NASCAR event, bystanders may be injured or killed. Similar results may occur during Biketoberfest and Bikeweek when hundreds of thousands of motorcycle enthusiasts visit Volusia County.	Property is at risk to a civil disturbance. Rioters may damage both private and public property, disrupting the ability to respond to the situation and causing damages in the hundreds of thousands of dollars. Florida has experienced seven major riots, beginning with the 1923 Rosewood riot, then 1967 Tampa riots, 1980 Miami riots, 1982 Miami riots, 1987 Tampa riots, 1989 Tampa riots, and most recently the 1996 St. Petersburg riots.	The environment is at moderate risk to a civil disturbance. Rioters may burn vehicles and buildings, releasing toxic gas, fumes, and fluids onto roads.	Program applications will not be adversely affected by a civil disturbance.
Coastal Oil Spill		The impact of a coastal oil spill may impact those with pre-existing breathing difficulties living close to the coast. The VCHD and VC Environmental Management will monitor air, water, sediment, and waste generated by the cleanup operations.	Property is not directly at risk from a coastal oil spill.	The environment is at high risk to the impacts from a coastal oil spill. Refer to the "Volusia County Coastal Oil Spill Cleanup and Debris Removal Plan" beginning on page 7 for a description of the potential environmental impact from an oil spill.	Program applications will not be adversely affected by a coastal oil spill.
Terrorist Attack		The citizens of Volusia County are at risk to a terrorist attack every day. Volusia County is home to NASCAR and hosts hundreds of thousands of visitors every year for race events, motorcycle events, and other spectator events such "Wings and Waves" and the New Smyrna Beach "Balloon Fest." Volusia County is home to five colleges and universities with an international blend of students. The risk of terrorist attack include injury and death.	Property is at risk to a terrorist attack. A single explosion or dirty bomb could destroy multiple facilities and injure or kill hundreds of people.	The environment is at risk to a terrorist attack. A dirty bomb or large explosion could potentially contaminate a large area.	Program operations are at minimal risk to a terrorist attack. The VCEOC is a hardened, secure facility. Should a terrorist attack occur in Volusia County, additional resources may be necessary that would be requested through mutual aid agreements and the State. Routine program operations may be temporarily suspended.
Mass Migration		The citizens of Volusia County are at minimal risk to a mass migration event.	Property is not directly at risk from a mass migration event.	The environment is at minimal risk to a mass migration event.	Program operations are at minimal risk to a mass migration event.
HAZMAT (fixed, mobile, and terrorism)		The citizens of Volusia County are at risk to Hazardous Materials (HAZMAT) every day. HAZMAT can come from fixed or mobile sources, (facilities, trains, semi trucks) or can be intentionally used for harm in a terrorist act. Citizens may be impacted on roadways, at school, in their homes, through their food supply, or in public venues (large stadiums, athletic events, movie theaters, the Speedway, etc). The risks of hazardous materials may be illness, injury, or death. With 2 major interstate highways, 2 major rivers, and 2 railroads in Volusia County, hazardous materials incidents occur on a daily basis; fortunately, the vast majority of these involve minor petroleum spills or sewage discharges.	Property in Volusia County is at risk and vulnerable to the impacts of hazardous materials. Chemical spills, bioterrorism, WAD, cyber attacks, etc, all impact our property and infrastructure. A single explosion could devastate a facility or cluster of facilities. Homes and businesses could receive damage or even collapse. Hazardous materials can erode or corrode infrastructure as well.	The environment is highly vulnerable to hazardous materials, regardless if the release or spill is accidental, intentional, or natural. Hazardous materials can be spread through water, air, or the food supply. Once HAZMAT are in environmental systems, it may take days, weeks, months, or years to clean-up.	Program operations are at a minimal risk to HAZMAT. The VCEOC is not located in close proximity to any hazardous materials facilities. Volusia County Environmental Management, the lead agency for hazardous materials (ESF 10), would work closely with the Volusia County Fire Services HAZAMT team during a large HAZMAT event.
Agroterrorism		Agroterrorism is a term used to denote the deliberate introduction of disease-causing organisms and chemicals into the food supply through agriculture. It could impact the public if crops or agricultural foodstuffs contaminated with disease-causing organisms were to enter the food chain.	Agroterrorism could potentially impact crops and livestock. Losses could be in the millions of dollars.	Agroterrorism could have a negative impact on the environment from the standpoint of crop destruction.	Program applications will not be adversely affected by an agroterrorism event. If necessary, additional support would be requested through mutual aid and FDEM.
Citations:					
US Census Bureau		www.census.gov			
FEMA		www.fema.gov			
FloodSmart		http://www.floodsmart.gov			
U.S. - Italy Research Workshop		http://training.fws.gov/CSP/Resources/conservation_science_web_series/information_page/dubowy/Environmental_Effects_of_Extreme_Floods.pdf			
National Flood Hazard Layer		https://hazards.fema.gov/femaportal/wps/portal/NEH/WMS/kmzdownload			
NOAA Wildfire Report 2012		http://www.ncdr.noaa.gov/ndc/fire/			
Florida Riot History		http://www.comexions.org/CslLibrary/Docs/CAP-Riots_List.htm			

CONSEQUENCES (4.3.2)		The Public	Responders	Continuity of Operations & delivery of services	Property, facilities & infrastructure
HAZARD/HIRA					
Natural					
Hurricanes/Tropical Storms		The public may face extreme consequences from hurricanes and tropical storms. Hurricanes have the potential to injure and kill people, destroy residences and businesses, and interrupt water, power, and sewer services necessary to return to a normal way of life. Regardless if citizens have insurance or receive assistance, the recovery process from a major hurricane may be very costly and take weeks, months, or years to complete and have serious psychological impacts.	Responders may face extreme difficulties when responding to a hurricane or tropical storm event. Hurricanes can down trees and power lines, destroy critical infrastructure such as local EOCs, fire stations, and hospitals, and damage bridges, roadways, and government buildings critical for response and recovery operations. Responders may have to rescue citizens isolated without resources. Responders should be aware of their risks at all times.	In an extreme event, such as a major hurricane, there may be an impact on delivery of routine program operations as the focus will be on response/recovery to the event.	There are numerous potential consequences that may result from a hurricane or tropical storm. Property along the coast and in storm surge areas may be severely impacted or destroyed. County facilities along the coast in storm surge zones have been identified. Critical infrastructure such as utilities, roadways, bridges, hospitals, EOCs, Police/Fire/EMS stations may be damaged or destroyed in an event.
Floods		The public may face extreme consequences from flooding and/or flash floods (although Volusia County does experience true "flash flooding"). Floods have the potential to injure and kill people, especially those who drive through flooded roadways. Floods can destroy residences and businesses, and interrupt water, power, and sewer services necessary to return to a normal way of life. Regardless if citizens have flood insurance or receive assistance, the recovery process from a flood may be very costly and take weeks, months, or years to complete.	Responders may face difficulties when responding to a flood event. Floods can destroy homes, businesses, and critical infrastructure such as local EOCs, fire stations, and hospitals. Floods can wash out bridges and roadways, as well as destroy government buildings critical for response and recovery operations. Responders may have to perform swift water rescues to citizens trapped in flooded areas. (This occurred during Tropical Storm Fay). Responders should be aware of their risks at all times.	The VCEOC is not located in a SFHA; however, many access roads may be impacted by flooding. In an extreme flood event, there may be an instance when access to the VCEOC is difficult. If something like this should occur, EOC personnel may be transported by VCSO's helicopter assets or all terrain vehicles.	There are numerous potential consequences that may result from a flood. Property in the floodplain or other low-lying areas may be severely impacted or destroyed. County facilities in the floodplain have been identified. Critical infrastructure such as utilities, roadways, bridges, and Police/Fire/EMS stations may be damaged or destroyed in an event.
Thunderstorms		The public may face some minor consequences from a thunderstorm. Thunderstorms have the potential to injure and/or kill people, damage residences and businesses, and interrupt power service. These impacts are very minimal compared to hurricanes and floods. It is important for beach goers to leave the beach when a thunderstorm approaches. Boaters and golfers should seek shelter. Recovery from a thunderstorm event may take several days.	Responders may face some difficulties when responding to a thunderstorm event. Trees may be down, blocking critical roadways and access points. Power lines may also be down in roadways or on private property creating a dangerous situation. Localized flooding may make some roads impassible.	VCEDM does not anticipate any issues maintaining operations and the delivery of services following a thunderstorm. In a catastrophic event, VCEDM has a COOP Plan in place that could be activated and implemented at any time.	Consequences to property, facilities, and infrastructure from thunderstorms are minimal. Downed trees and power lines are typical consequences from thunderstorms. Roofs and windows of homes and businesses may be damaged. Power service to residences and critical facilities may be impacted in the short-term.
Tornadoes		All of the public in Volusia County is at risk to tornadoes. Tornadoes are a common occurrence in Volusia County. The public could face serious consequences from a touchdown, particularly mobile home residents. Tornadoes can be deadly. Common consequences are damage to homes and businesses, interruption of utility services, and devastation to the local economy.	Responders may face significant difficulties responding to a tornado touchdown. Search & rescue operations may be required. Communication systems may be destroyed. In an extreme event, road signs and landmarks may be missing when trying to navigate to citizens in need. Power lines, debris, and trees may block roadways and access points. Responders should exercise extreme caution.	VCEDM does not anticipate any issues maintaining operations and the delivery of services in the event of a tornado in the County. If there is a widespread tornado outbreak, or if the VCEOC is directly hit by a tornado, it may be necessary to move to the alternate EOC location or function from another location to maintain operations during the event. For more information, see the VCEDM COOP Plan.	All property in Volusia County is at risk to tornadoes. The consequences to property, facilities, and infrastructure from a tornado may be catastrophic. Depending on the scale of the tornado, damage could be minimal or cataclysmic. Historically, Volusia County's greatest magnitude tornado was an EF3. An EF3 can cause extensive damage, level well constructed homes and buildings, uproot trees, and throw heavy vehicles. Public infrastructure and utilities may be demolished.
Wildfire		The public will feel the direct consequences of a wildfire if their home or place of employment is in the wildfire impact zone. Homes and businesses may be destroyed in a fire, utility service could be interrupted, and access to roadways may be limited. The public may also be impacted by air pollution from the wildfires.	Responders will be directly impacted by a wildfire. Wildfires may change directions quickly as the wind and environmental elements change. Wildfires are often difficult to control and may take numerous resources to do so. Inhalation of smoke and fumes may pose a health risk to firefighters.	VCEDM does not anticipate any issues maintaining operations and the delivery of services during a wildfire. In an event that directly impacts the VCEOC, VCEDM has a COOP Plan in place that could be activated and implemented at any time.	Property, facilities, and infrastructure in the wildfire zone may be significantly impacted. Homes and businesses may be destroyed in a fire, utility service could be interrupted, and access to roadways may be limited.
Drought/Extreme Heat		Consequences of drought and extreme heat on the public are not always direct. Agriculture will be the most directly impacted by drought. The public's food supply may be impacted. If water restrictions are implemented by government, residential lawns and gardens will be impacted.	Responders will not be impacted by drought. In extreme heat, caution should be exercised for first responders. Responders must be sure to maintain adequate hydration.	Historically VCEDM has not had any issues continuing operations and delivering services during droughts or extreme heat events.	Homes, businesses, critical facilities and infrastructure should not be significantly impacted by drought and extreme heat. In some drought situations, river flows may be reduced and impact hydrologic processes such as irrigation capacities, and tourism related businesses (lakes, golf courses, etc.). The St Johns River Water Management District may prohibit lawn irrigation, which may impact residences and golf courses. Wells may fall to dangerously low levels.
Hail		Consequences of hail on the public include possible injuries and, in extremely rare cases, death. Hail may indirectly cause public injury if it results in automobile accidents. Because hail is a product of thunderstorms, see "Thunderstorms" for more consequences to the public.	Consequences of hail on responders is minimal. Hail is typically a very brief event due to physics of the atmospheric conditions in Volusia County that are required to make hail. Responders should remain inside during hail storms. Because hail is associated with thunderstorms, see "Thunderstorms" for more information.	VCEDM will not have any issues continuing operations and delivering services during hail events. See "Thunderstorms" for more information.	Hail has the potential to damage property, facilities, and infrastructure. Large hail can puncture roof tops, windshields, vehicles, windows, and other outdoor structures. Because hail is associated with thunderstorms, see "Thunderstorms" for more information.

CONSEQUENCES (4.3.2) (con't)		The Public	Responders	Continuity of Operations & delivery of services	Property, facilities & infrastructure
HAZARD /HIRA					
Natural					
Severe Winter Storms	Consequences to the public from winter weather include cold temperatures and the potential loss of power. The major impact of severe winter storms in Volusia County is on the homeless population. Shelters may need to be opened during severe winter storms.	Responders will not be adversely impacted from a severe winter storm, as the duration is limited in Volusia County.	Program operations will continue during a winter weather event. If there is a power outage, VCEMD has redundant power, IT, and communication systems in place to maintain operations. VCEMD will continue to coordinate the statewide response throughout the entire winter weather event.	The greatest potential impact of cold weather is on the County's agricultural industry. Orange groves may freeze. The fern industry could be seriously impacted. This could result in lost jobs, most of which are held by migrant workers.	
Lightning	Consequences of lightning on the public include possible injuries and, some cases, death. Lightning may strike homes and businesses, potentially sparking a fire or damaging electrical systems. Because lightning is a product of thunderstorms, see "Thunderstorms" for more consequences to the public.	Consequences of lightning on responders are minimal. Lightning may spark building and housing fires, requiring immediate response. When possible, responders should remain inside if there is lightning. Because lightning is associated with thunderstorms, see "Severe Thunderstorms" for more information.	VCEMD will not have any issues continuing operations and delivering services during lightning events. In the event of a lightning strike to the building, VCEMD has a backup power generator, redundant communication systems, and has a IT failover system in place. See "Severe Thunderstorms" for more information.	Lightning has the potential to damage property, facilities, and infrastructure. Lightning can spark fires and destroy electrical systems. From 1996 - 2013, NOAA's Climatic Data Center reports there has been 1 fatality, 20 injuries, and \$1.37 million in property damage caused by lightning in Volusia County. Because lightning is associated with thunderstorms, see "Severe Thunderstorms" for additional information.	
Storm Surge	Consequences of storm surge on the public could be devastating. During storm surge, sea water inundates low lying areas of coastal regions drowning human beings and live-stock, erodes beaches and embankments, destroys vegetation and reduces soil fertility.	Consequences of storm surge on responders would be similar to those encountered during a major hurricane.	If there were a major storm surge event, routine program operations may be impacted to a similar extent as during a major hurricane.	Storm surge has the same potential impact on property, facilities, and infrastructure as do major hurricanes.	
Coastal Erosion	The public faces numerous consequences to coastal erosion. Coastal erosion plagues many of the public beaches in Volusia County. In addition to the loss of public beaches, private property and homes could be destroyed. Homes could into the ocean in some rare instances.	Responders will not be impacted by coastal erosion.	VCEMD will not have any issues continuing operations and delivering services due to coastal erosion.	Properties, facilities, and infrastructure along the coastline may be impacted by coastal erosion. Coastal erosion can cause homes to fall into the ocean. Critical utilities and roadways may be impacted if the beaches erode and water is able to inundate their systems. Tax revenue may be impacted.	
Tsunami	Consequences of a tsunami on people would be similar to those of a major storm surge event.	Consequences of a tsunami on responders would be similar to a major storm surge event.	The impact of a tsunami on program operations would be similar to a major storm surge event.	The impact of a tsunami on property, facilities, and infrastructure would be similar to that experienced during a major storm surge event.	
Sinkhole	Consequences of a sinkhole on people would be minimal. Should a major sinkhole form on or near a major roadway,, it's possible cars may drive into it before responders arrive.	Consequences of a sinkhole on responders would be minimal.	There would be no impact on program operations from a sinkhole.	The impact of a sinkhole on property, facilities, and infrastructure would be minimal. The most expensive sinkhole event was the sinkhole that opened on Howland Blvd in Deltona. Approximately 1 million cubic yards of dirt was needed.	
Sea Level Rise	Consequences from sea level rise to the public include loss of residential property value, loss of businesses, and a loss of community assets such as beaches and other water-adjacent public parks. Sea level rise is not a threat to life on its own. It can, however, increase the storm surge associated with hurricanes over the long term.	Responders would likely not be impacted by sea level rise. Structure deterioration could put life at risk, however this issue would likely be solved (or the property would be vacated) years before occupants were put at risk.	There would be no impact on continuity of operations over the long term. Strategies such as facility relocation can ensure continuity within the County.	Property values can be completely lost over the long term with rising seas. Critical facilities within the high risk sea level rise zones should be relocated or public services could be interrupted. Infrastructure at risk includes stormwater pipes, outfalls, lift stations, pump stations and electrical stations. Stormwater infrastructure in particular is vulnerable to saltwater intrusion, which can erode pipes.	
Public Health Emergencies	Consequences to the public from public health emergencies (influenza, plague, food contamination, etc) are vast. The public may experience temporary illness, long-term illness, or even death. Hospitals and doctor's offices may become crowded, patients may experience long lines, and pharmaceuticals may be limited. In 2009, the H1N1 pandemic swept the U.S. Vaccinations, medications, and education materials were provided to the public to minimize the impacts of the flu. (CDC H1N1 Flu)	Responders may also feel the consequences of public health emergencies. They may be exposed to the risk and become ill. Responders may have to wear protective gear and receive vaccinations to mitigate their risk. For more information on a Public Health Emergency Response, refer to the VCHD pandemic flu annex.	In an extreme event, such as a widespread public health emergency, there may be an instance when the VCEOC is impacted. If the VCEOC becomes contaminated, it may be necessary to move to our alternate EOC location or function from another location to maintain operations during the event. For more information, see the VCEM COOP Plan.	It is unlikely that the consequences of a public health emergency would impact property, facilities, or infrastructure.	

CONSEQUENCES (4.3.2) (con't)		The Public	Responders	Continuity of Operations & delivery of services	Property, facilities & infrastructure
HAZARD /HIRA					
Human-Caused or Technological					
Terrorist Attack	The public is at risk to a terrorist attack. NASCAR events typically have over 100,000 spectators. Bikeweek/Biketoberfest draw 500,000 participants. We have 5 colleges and universities, and most have stadiums. Shopping malls are plentiful. The consequences of a terrorist attack may be serious injury, death, and psychological impairment.	Responders are at risk to a terrorist attack. It's possible responders could be injured or killed attempting to rescue survivors from buildings. Secondary devices are always a concern.	Continuity of operations would not be seriously impacted by a terrorist event. The CEOC is a secure, hardened facility. If there were a direct attack on the CEOC, it would be limited to the lobby area. In such a case, it may be necessary to move to our alternate EOC for a short period.	Property, facilities, and infrastructure are all at risk to a terrorist attack. Since 9/11, the County and its municipalities, as well as colleges and universities, have taken tremendous effort to increase security and educate the public about terrorist attacks.	
Cyber Attack	The impact on the public from a cyber attack could be substantial in a worst-case scenario. If the grid were to be taken out, an extended period of power outage would cause food to spoil. Medication that requires refrigeration could be lost. People dependent on ventilators and oxygen concentrators could be impacted.	Responders would not be impacted by a cyber attack.	Continuity of operations would not be seriously impacted by a cyber attack. Information contained on the County web site would be unavailable.	The impact of a cyber attack on property, facilities, and infrastructure would be minimal.	
Civil Disturbance	The impact on the public from a civil disturbance would be limited to those taking part in the civil disturbance and those in the vicinity of the event.	Responders may be impacted by a civil disturbance. It's possible that responders could be injured or killed by those instigating the civil disturbance. Responders must exercise extreme caution when dealing with a civil disturbance.	Continuity of operations would not be seriously impacted by a civil disturbance. The VCEOC is a secure facility. In extreme events, mutual aid would be requested from adjacent counties.	The impact of a civil disturbance on property, facilities, and infrastructure could be substantial. Homes and businesses could be burned. Facilities could be damaged. Streets may be blocked.	
Mass Migration	The impact on the public from a mass migration event would be minimal.	The impact on responders to a mass migration event would be limited to those responders managing the mass migration population.	Continuity of operations would not be seriously impacted by a mass migration event. In a large event, mutual aid would be requested from adjacent counties.	The impact of a mass migration event on property, facilities, and infrastructure would be minimal.	
Coastal Oil Spill	The impact of a coastal oil spill on the public would be minimal. Persons with pre-existing breathing issues may be impacted by fumes. Volusia County Environmental Management and the VCHD will monitor air quality.	Responders may be impacted by a coastal oil spill. Appropriate PPE will have to be worn at all times to prevent contamination.	Continuity of operations would not be impacted by a coastal oil spill.	It is unlikely that a coastal oil spill will have an impact of property, facilities, or infrastructure. Oil may contaminate docks and boats if were to enter through Ponce de Leon inlet.	
Agroterrorism	The public may be adversely impacted by an agroterrorism event. If food or agriculture is infected with a disease causing organism, it may make its way into the food chain. The effects could impact hundreds or thousands of citizens.	Responders may be impacted by an agroterrorism event if they are exposed to food or agricultural products infected with a disease causing organism.	Continuity of operations would likely not be impacted by an agroterrorism event.	It is unlikely that an agroterrorism event would have an impact on property, facilities, or infrastructure.	
HAZMAT (fixed, mobile and terrorism)	The public will be immediately impacted by the consequences of a Hazardous Materials (HAZMAT) release/spill/explosion. HAZMAT can come from fixed or mobile sources, or can be intentionally used for harm in a terrorist act. Citizens may be impacted on roadways, at school, in their homes, through their food supply, or in public venues (large stadiums, athletic events, movie theaters, etc.). The consequences of hazardous materials may be illness, injury, or death. In a major event (such as a radiological release, explosion, or chlorine spill), citizens may be displaced from their homes until the site is cleaned.	Responders face the immediate consequences of HAZMAT incidents. They must determine the type of material released/spilled, and decide on the appropriate response and cleanup of the material. The County has a variety of response teams to include HAZMAT, RMAT (radiological material), and EOD (bomb squad). These responders are specially trained to deal with these incidences and they are provided protective gear to reduce their vulnerability to the hazardous materials.	In the event of a HAZMAT release/spill or Terrorist act, there may be an instance when the VCEOC is impacted. If the VCEOC is damaged or the delivery of services is interrupted, it may be necessary to move to our alternate EOC location or function from another location to maintain operations during the event. For more information, see the VCEMD COOP Plan.	Property, facilities, and infrastructure will be significantly impacted by a HAZMAT incident. Especially in the event of an explosion, homes, businesses, industries, and infrastructure may be damaged or destroyed. In addition, most mobile hazmat releases are caused by traffic accidents, which can destroy vehicles, roadways, and signage.	
Citations:					
CDC H1N1 Flu	http://www.cdc.gov/h1n1flu/				
VCHD Public Health Preparedness	http://www.floridahealth.gov/chd/Volusia/hurricaneinformation.html				
CSIRO impacts of an oil spill	http://www.csiro.au/Outcomes/Oceans/Hot-ocean-topics-index/Environmental-impact-of-oil-spills.aspx				
U.S. States & Territories National Tsunami Hazard Assessment: Review and Update	http://nhtmp.tsunami.gov/2012tsuhazworkshop/abstracts/Dunbar-Weaver_abs.pdf				

CONSEQUENCES (4.3.2) (con't)	 Environment	Economic condition of the Jurisdiction	Public Confidence in governance
HAZARD/HIRA			
<i>Natural</i>			
Hurricanes/Tropical Storms	Consequences to the environment include erosion of critical dunes, impacts to sensitive coastal ecosystems, downed trees and vegetation, and polluted waterways from the runoff of debris and hazardous materials. VC Environmental Management and the VCHD will take the lead on the monitoring and cleanup of any adverse environmental impacts.	Hurricanes and tropical storms have impacted Volusia County in the hundreds of millions of dollars. The 2004 hurricanes were the largest, most costly disaster. The economic impact to affected jurisdictions has been significant. In any hurricane event, the impact to tourism is millions of dollars a day. It may take several years to recoup the economic costs of a single hurricane event.	Maintaining public confidence in emergency management and County Government is vital. To ensure the public is prepared for a hurricane, VCEMD has completed the following: 1) Video Disaster Preparedness Guide available on the website, 2) Surveys capturing behavioral patterns conducted after every hurricane evacuation out to gauge the level of preparedness and evacuation compliance, 3) Numerous public presentations, 4) VCEMD prepares for hurricane season with a countywide media campaign through VC Community Information and the Daytona Beach News Journal 5) In the event of a hurricane, the PIO section has premade materials for use in VCEMD's comprehensive social media program; 6) Throughout the year VCEMD provides preparedness information via the County's weekly video magazine broadcast on WDSC. All of these programs are in place to instill public confidence in government, even in times of a disaster. For more information, see the ECFRPC Behavioral Analysis: documenting evacuation order compliance.
Floods	Environmental consequences to flooding are vast. Flooding may erode river beds, causing sediments to enter the waterways, clogging our water management systems & waterways downstream. Floods can bring hazardous materials or pollution into waterways via runoff. Riparian ecosystems are negatively impacted with the introduction of sediments, pollutants & nutrients. VCHD and VC Environmental Management will monitor the waterways and riparian areas for any adverse impacts.	From 1994 - 2009 there were 11 major flood events in Volusia County causing over \$100,000,000 in damages. (Table 5.14) As of 2010, repetitive losses in the County total almost \$36,000,000 (Table 5.15). The impact of flooding on transportation, agriculture, business continuity, and government services is substantial. Mitigation practices can reduce the impact of flooding on our economy. It is also important that citizens and businesses purchase flood insurance so they can be operational in a short amount of time.	Education, mitigation activities, and awareness are key components to maintaining public confidence in government during a disaster. In conjunction with FEMA, NOAA, USACE, FDEM, and the Florida Department of Insurance, the County provides information on floods and flood insurance to the public. During the NFIP mapping process, citizens were invited to participate and learn about flood risks. VCEMD has distributed over 5,000 NOAA weather radios to mobile home residents to alert them of flood events. VCEMD has premade media products for their social media campaign if there is an event. Additionally, VCEMD has managed 38 Flood Mitigation Assistance grant projects, mitigating homes against future flood losses. This serves to build public confidence in governance.
Thunderstorms	Thunderstorms in Volusia County have historically had few consequences to the environment. In some cases, these storms can down trees and vegetation and cause localized flooding. Please see the "Floods" above. No major consequences to the environment are expected.	Consequences to the economic condition of the County will be minimal. The County has numerous thunderstorms throughout the year. The annual cost of damage to property and infrastructure is minimal.	Public confidence in government will not be impacted by severe Thunderstorm Events. In the case of a catastrophic storm, VCEMD has premade media products for distribution on our webpage and on our social media outlets (@VCEMDemergencyinfo). NOAA weather radios will also send out important information to citizens so they can educate themselves and find resources after the event.
Tornadoes	Because of the vast range of wind speeds associated with tornadoes, consequences to the environment vary greatly. Even an EF0 (65-85mph) can uproot trees and vegetation. In stronger tornadoes, debris will be tossed miles away from the source, potentially entering our waterways. Hazardous materials may escape if vehicles are damaged or storage tanks are compromised. VC Environmental Management and VCHD would monitor the environment for adverse impacts.	Tornadoes are typically a local disaster. The County's economy may only be minimally impacted by a tornado event. If a large outbreak occurred, there could be a greater economic effect. If a small community was hit by a severe tornado, the entire community & local economy could be devastated. Local assistance through the County COAD, especially the American Red Cross, would be utilized.	Public confidence in government will not likely be impacted by a tornado event. If there is a countywide tornado outbreak, VCEMD has premade media products for distribution on our social media outlets (@VCEMDemergencyinfo). NOAA weather radios will also send out important information to citizens so they can educate themselves and find resources after the event. Some local communities have tornado sirens and community shelters to protect their citizens.
Wildfire	Although wildfires are a natural process, the environment may be negatively impacted. Not only are trees impacted by these fires, so are the native species of plants and animals. The smoke and ash from the fires can pollute waterways and our air. The VC Fire Services and VCHD will monitor the air and water quality in an event.	Wildfires are typically a local disaster and the County's economy should not be impacted to a large extent. If a large fire does occur and cannot be controlled quickly, there could be a greater economic effect. The Coke Zero race was postponed one year due to smoke from wildfires. If a small community was hit by a wildfire, the local economy could be devastated. Local assistance through the County COAD, especially the American Red Cross, would be utilized.	Public confidence in government will likely not be impacted by a wildfire event. If a large wildfire occurs that cannot be quickly controlled, VCEMD has premade media products for distribution and through social media outlets (@VCEMDemergencyinfo). NOAA weather radios will also send out important information to citizens so they can educate themselves and find resources after the event. In 1998, 29,000 homes were at risk from wildfires. Only 6 homes, 1 mobile home, and 2 businesses were lost. This success serves to bolster public confidence in governance. (5.14.3)
Drought/ Extreme Heat	Environmental consequences of drought & extreme heat are significant. Drought reduces the availability of water, reduces crop yields, & impacts our local ecosystems. Droughts may result in an increase in wildfires. For instance, the 1998 drought contributed directly to the wildfires that burned over 163,000 acres. (Section V)	Drought has the potential to significantly impact the County's economy. The annual economic impact of Volusia County's agriculture and natural resources industries is \$781 million. An extended period of drought could seriously impact this.	Public confidence in government will likely not be impacted by a drought or extreme heat event. Droughts are common in Florida and Volusia County. Insurance and assistance programs are widely available to farmers.
Hail	There are no known direct consequences on the environment from Hail. See "Thunderstorms" for more information.	Consequences to the economic condition of the County will be minimal to non-existent, as hail is a fairly uncommon event. The County has very few hail events each year. The annual cost in damages is minimal. Most of the damages from hail are covered under homeowners insurance and auto insurance & therefore do not impact local economy.	Public confidence in government will not be impacted by a hail event. See "Thunderstorms" for more information.
Sea Level Rise	Consequences to the environment include loss of beaches, dune systems, riverbank ecosystems and other ecosystems near the shoreline.	Economic consequences include loss of property value and loss of business income. Mitigation in the short term can greatly reduce long term economic risk to sea level rise.	Public confidence in government would be affected in two ways; 1) Via inaction on sea level rise issues, leading to losses in property value and critical environmental assets, or 2) Too much action on sea level rise in the short term, leading to over-investment.

CONSEQUENCES (4.3.2) Part 2		Environment	Economic condition of the jurisdiction	Public Confidence in governance
HAZARD/ THIRA				
<i>Natural</i>				
Severe Winter Storms		Consequences to the environment from winter weather are minimal. Non-native plant species may be impacted.	The economic condition of the County may be impacted by an extended cold spell. The fern industry would be impacted the most.	Public confidence in government will likely not be impacted by a winter weather event. Winter weather is not a common occurrence in Volusia County.
Lightning		Consequences to the environment from lightning are minimal. The greatest impact is lightning-generated fires. In the case of a fire, see "Wildfires" for more information. Also see "Severe Thunderstorms" since lightning is associated with this hazard type.	Consequences to the economic condition of the County will be minimal to non-existent. Most of the damage resulting from lightning strikes are covered under homeowners insurance, & therefore do not impact the local economy.	Public confidence in government will not be impacted by a lightning event. See "Thunderstorm" for more information.
Storm Surge		Consequences to the environment from storm surge could be devastating. Salt water intrusion into sensitive estuaries could destroy ecosystems. Salt water would intrude into the aquifer, our source for drinking water. Storm surge would spread sewage from septic systems.	Consequences to the economy from a storm surge event are potentially devastating. Homes and businesses would be destroyed. The property tax base would suffer. Tourism, a main driver of our economy, would be impacted.	Public confidence in government may be impacted depending on the speed of recovery. If the recovery process is perceived to going too slow public confidence in the government would be lessened. This is a real possibility considering that the public expects immediate response from government. Public confidence in government suffered in the wake of hurricanes Katrina and Sandy.
Coastal Erosion		There are several consequences to the environment from coastal erosion. Coastal erosion by wind or water can deplete the coastal ecosystems. Protective dunes on the shore may be reduced or washed away in hurricanes and high surf. Eroded sands and soil can enter water and sewer systems, causing issues for the public and environment.	Coastal erosion is very costly and can burden local economies. Beach nourishment is extremely costly, approximately \$2.00/cubic yard.	Public confidence in government should not be impacted by coastal erosion. Rapidly eroding beaches remain a high priority for nourishment.
Tsunami		The consequences to the environment from a tsunami would be similar to that of storm surge.	The consequences to the economy would be similar to that of storm surge.	Public confidence in government may be impacted to a similar extent to that of storm surge.
Sinkhole		The most important current and future environmental issue with respect to sinkholes is the sensitivity of sinkhole aquifers to groundwater contamination. The effect of man on sinkholes is most severe in cases where polluted surface waters enter sinkhole aquifers.	There will not be a major impact to the economy due to a sinkhole event.	Public confidence in government should not be impacted by a sinkhole event.
Public Health Emergencies		Consequences to the environment from a public health emergency are unlikely. Unless the event is terrorism or HAZMAT related, there will be no direct impact. See HAZMAT below for more information.	The economic condition of the County may be impacted by a widespread public health emergency. If a significant percentage of the population becomes ill, they will not be able to go to work or spend money. The economy will be directly impacted by both of these factors. With vaccinations and early detection of pandemics and other public health issues, the impacts can be minimized.	Public confidence in governance may be minimally impacted by a public health emergency. In Volusia County, Environmental Management at the VCHD monitors air & water quality, tracks potential influenzas & other contagious viruses/bacteria, and provides education & outreach on health. VCHD advertises their public health preparedness capabilities online to show transparency to the public. VCHD also runs hospital preparedness programs and hosts healthcare coalitions & partnerships. In a widespread event, VCHD is prepared to meet the needs of the public. Therefore, public confidence in government should only be minimally impacted in a major event.

CONSEQUENCES (4.3.2) Part 2		Environment	Economic condition of the Jurisdiction	Public Confidence in government
HAZARD/HIRA				
Human-Caused or Technological				
Terrorism		The environment could be impacted by a terrorist event, particularly if a dirty bomb were used. A large explosion at a facility could release large amounts of asbestos and other toxic materials that would be carried by the wind and possibly enter lakes and rivers.	In the event of a large terrorist attack, the economy would be negatively impacted. Tourism would certainly be impacted to a serious degree.	Public confidence in government would be impacted by a terrorist event. If there were a large event at a large gathering of people (the Speedway for example) and there were numerous deaths and injuries, the public would perceive that government's ability to detect and prevent terrorist attacks was unsatisfactory. Even if there were a small event, the public would expect the government to have had advance information. A dedicated public affairs effort would be necessary to try to regain the public's confidence.
Cyber Attack		Consequences to the environment would not result from a cyber attack.	The economic condition of the County may be impacted by a cyber attack. Citizens may not be able to use computers to order goods and services or pay bills online. Online delivery of public services may be diminished.	Public confidence in government may be impacted by a cyber attack, particularly if major systems such as the electrical grid are impacted. The public may perceive that the government did not take sufficient steps to prevent the attack, and that recovery from the attack is taking too long.
Civil Disturbance		Minimal consequences to the environment may result from a civil disturbance in the form of smoke and hazardous fumes from fires.	The economic condition of the County may be impacted by a civil disturbance. If there were a large event, tourists may be hesitant to visit Volusia County due to the perception that it is not safe to do so. Homes, businesses, and critical facilities may be damaged and require expensive repairs. If large numbers of businesses were impacted, tax revenue would be impacted.	Public confidence in government may be impacted by a civil disturbance. If the government is unable or takes too long to bring the civil disturbance under control, the public may perceive that government is not able to deal with this type of event.
Mass Migration		There would be no consequences to the environment from a mass migration event.	The economic condition of the County should not be impacted by a mass migration event.	Public confidence in government may be impacted by a mass migration. If the government is unable or takes too long to manage the event by efficiently organizing processing, screening, and housing the migrants, the public may perceive that government is not capable of dealing with mass migration event.
Coastal Oil Spill		There would be serious consequences to the environment from a coastal oil spill. Sensitive ecosystems would be damaged. Turtle nesting sites may be destroyed. The sand would be contaminated.	The economic condition of the County would be seriously impacted by a coastal oil spill event. During the Deep Water Horizon oil spill, tourism in Volusia County suffered as people thought all of Florida was impacted. All of our charter fishing industry would be devastated. If a coastal oil spill were to occur here, tourism would cease. Businesses located on the peninsula may have to permanently shut down. Tax revenue would be severely impacted.	Public confidence in government would be impacted by a coastal oil spill event. Clean-up and environmental restoration is likely to take months to accomplish. The public would get frustrated with the pace of the recovery. Volusia County PIO would be constantly reassuring the public that government, in cooperation with private industry, was doing everything it could to recover from the spill.
Agroterrorism		There may be serious consequences to the environment from an agroterrorism event. If a disease-causing agent were introduced into the agricultural areas of the County, millions of dollars in damage could result.	The economic condition of the County would be seriously impacted by an agroterrorism event. Agriculture is a \$781 million a year business in Volusia County.	Public confidence in government may be impacted by an agroterrorism event. If the event spread throughout the County and impacted multiple farms, the public may perceive that government is not able to manage an agroterrorism event.

HAZMAT (fixed, mobile and terrorism)	The environment is likely to experience significant consequences from a HAZMAT incident. Sensitive ecosystems could be destroyed or significantly disturbed. Hazardous materials can be quickly spread through water, air, or the food supply. Once HAZMAT are in our environmental systems, it may take days, weeks, months, or years to clean-up.	Depending on the size of the incident, the County's economy could experience enormous consequences. As reported by the Huffington Post, the BP oil spill in 2011 has cost approximately \$40 billion to clean up. This would be a worst-case scenario. More common incidents such as HAZMAT spills on highways or releases at chemical facilities impact the economy if an industry or transportation routes are shut down.	Public confidence in governance may be impacted by a HAZMAT incident. In small, localized events, VCEMD does not believe there would be a impact on public confidence. These events happen on a regular basis. In a major chemical release, radiological release, or terrorist incident, citizens may be inclined to lose confidence in governance. In these instances, VCEMD is prepared to draft and issue media products for distribution on our webpage (www.volusia.org/emergency) or on our social media outlets (@vcemergencyinfo).
Citations:			
Volusia County Agriculture	http://www.volusia.org/services/community-services/extension/agriculture/		
FL Department of	http://www.freshfromflorida.com/Divisions-Offices/Marketing-and-Development/Education/For-the-Community/Video-and-Audio/Livestock-and-Animals/Video-Script-SART-State-Agricultural-Response		
FL Drought Status	http://www.plantmaps.com/interactive-florida-drought-conditions-map.php		
Beach Nourishment Study	http://coastal.tamuk.edu/AM/ComparisonofBeachNourishmentalongtheU.S.Atlantic,GreatLakes,GulfofMexico,andNewEnglandShorelines/index.html		
WCPA Oil Spill	http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/how-oil-harms-animals-and-plants-marine-environments.html		



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Resolution**

MEETING DATE: May 12, 2020
FROM: Valerie Manning
SUBJECT: A Resolution of the City Commission of the City of Holly Hill, Florida, Authorizing Change Order #4 to the US1 Utility Underground Project to Carter Electric and Authorizing the City Manager to Execute the Change Order for an Amount Not to Exceed \$39, 149.13 and 365 Days for Final; Providing for Severability; and Providing for an Effective Date.
NUMBER: 2020-R-23
APPLICANT:
PLANNER:

DISCUSSION:

On March 17, 2017, the contract for the burying of overhead utilities underground on US1 from Mason Avenue to Walker Street was awarded to Carter Electric Co., Inc., Daytona Beach, FL. Additional work is required to complete the undergrounding project. The scope of this work was not included in the original contract as it was planned to be completed later in the project.

Due to further coordination with Florida Power & Light (FPL) in regards to additional bollards to protect their equipment, a remainder of As-built work needed for completion of project, and a Post Construction video. These items will result in a \$6,576.40 overrun of the current contract value.

Additional work is necessary for the completion of the project due to FPL modifying the design and includes:

1. Rework of FPL conduit at revised pole locations - The undergrounding includes the transition from above ground to underground FPL facilities on the various side streets. FPL installed several new poles in these locations to accommodate the transitions. Due to field conditions, some of the poles were installed in different locations than originally planned for during the initial installation of the conduit. The revised pole locations require the rework of the conduit. This additional cost for this will result in a \$25,232.73 increase to the contract.
2. Additional survey services - Additional surveying services are required to complete the project. The City requested the Contractor to utilize his survey subcontractor to prepare four legal descriptions and sketches for easements that had not been acquired previously. FPL required specific as-built sketches for all of the equipment to verify the location of such within the easements and staking of the easements in the field

were necessary for FPL field review. The cost of these additional services are \$7,340.00.

The increase in the contract price as a result of this change order is \$39,149.13.

This contract has been purposely kept active to allow for the completion of the remaining work and additional work that may be necessary. As additional 365 days will allow the contract to extend until July 11, 2020. All work necessary for the utility companies to finish their undergrounding work is expected to be completed by that day.

FISCAL ANALYSIS:

This project is fully funded by CRA funds and the bid amount is within the allocated budget. This project is funded in account 139-8110-580.6300. There are sufficient budget funds remaining to fund this request.

STAFF RECOMMENDATION:

City staff and our consultant have reviewed these cost proposals and found them reasonable and fair. Much of the work/pricing are extensions of existing contract unit pricing and quantities. The remaining work is in line with the Engineer's estimate for that work.

COMMISSION GOALS:

Goal #1: Develop and maintain a sound and sustainable financial plan for the city that establishes sufficient reserves for all funds, ensures (whenever possible) that user fees pay for services rendered, provides a realistic capital improvement program, and encourages public/private sector partnerships and intergovernmental partnerships.

Goal #2: Enhance City aesthetics through beautification and maintenance of city property and public rights of way, consistent enforcement of zoning and property maintenance codes, and development of reasonable design standards and a corresponding process which is applicable to all new developments and business improvements in the city.

Goal #3: Implement the CRA master plan with a focus on the best utilization of vacant properties and blighted properties in the city. Attention should also focus on infrastructure improvements within the district and strategies to encourage private investment and business retention.

MOTION:

APPROVE AUTHORIZING CHANGE ORDER #4 TO THE US1 UTILITY UNDERGROUND PROJECT TO CARTER ELECTRIC AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE CHANGE ORDER FOR AN AMOUNT NOT TO EXCEED \$39,149.13 AND AN ADDITIONAL 365 DAYS ALLOWING THE CONTRACT EXTENSION UNTIL JULY 11, 2020.

ATTACHMENTS:

- Change Order #4 (PDF)

Resolution No. 2020-23

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, AUTHORIZING CHANGE ORDER #4 TO THE US1 UTILITY UNDERGROUND PROJECT TO CARTER ELECTRIC AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE CHANGE ORDER FOR AN AMOUNT NOT TO EXCEED \$39, 149.13 AND 365 DAYS FOR FINAL; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, AUTHORIZING CHANGE ORDER #4 TO THE US1 UTILITY UNDERGROUND PROJECT TO CARTER ELECTRIC AND AUTHORIZE THE CITY MANAGER TO EXECUTE THE CHANGE ORDER FOR AN AMOUNT NOT TO EXCEED \$39,149.13 AND 365 ADDITIONAL DAYS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City Commission of the City of Holly Hill has taken steps to move forward the burying of overhead utilities underground having completed the Secondary Phase of the work; and

WHEREAS, on March 17, 2017, the City has awarded the contract to perform the burying of overhead utilities underground in accordance with Bid #13 ST 03 Phase III to Carter Electric; and

WHEREAS, additional work is required to add additional bollards, remainder of As-builts, post construction video, re-work of FPL conduit at revised pole locations, and additional survey services; and

WHEREAS, additional time has also been requested by Contractor for the additional work described above and other issues that have occurred during construction.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. That the City Commission of the City of Holly Hill does hereby authorize the City Manager to execute a change order with Carter Electric for an amount not to exceed \$39,149.13 and 365 additional days extending the contract completion to July 11, 2020.

SECTION 2. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 3. EFFECTIVE DATE. This Resolution shall take effect immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020.

CHANGE ORDER FORM

PROJECT: *US-1 Utility Undergrounding Primaries Conversion*
 BID: *113-ST-03 Phase III*

CHANGE ORDER NO. 4

CONTRACTOR: Carter Electric Company, Inc.

The following changes are hereby made to the Contract Documents:

CHANGE IN CONTRACT PRICE: Original Contract Price: <u>\$ 2,697,130.82</u>	CHANGE IN CONTRACT TIMES: Original Contract Times: Substantial Completion: <u>June 2, 2018</u> Final Completion: <u>July 2, 2018</u>
Net changes from previous Change Orders: <u>\$ 186,543.34</u>	Changes in contract time from previous Change Orders: 247 Days
Contract Price prior to this Change Order: <u>\$ 2,883,665.16</u>	Contract Completion Date prior to this Change Order: Substantial Completion: <u>March 14, 2019</u> Final Completion: <u>July 12, 2019</u>
Net Increase (decrease) of this Change Order: <u>\$ 39,149.13</u>	Changes in contract time requested this Change Order Substantial Completion: N/A Final Completion: +365 days
Contract Price with all approved Change Orders: <u>\$2,922,814.29</u>	Contract Times with all approved Change Orders: Substantial Completion: <u>N/A</u> Final Completion: <u>July 11, 2020</u>

CHANGES ORDERED:

- I. GENERAL – This change order is necessary to cover changes in the work to be performed under this Contract. The General Conditions, Supplementary Conditions, Specifications and all parts of the Project Manual listed in Article 1, Definitions, of the General Conditions apply to and govern all work under this change order.

The change in price and/or delivery date described, is considered to be fair and reasonable and has been mutually agreed upon in full agreement and final settlement of all claims arising out of the modification including all claims for delays and disruptions resulting from, caused by, or incident to such modifications and change orders.

II. REQUIRED CHANGES:

CONTRACT PRICE: The contract price is hereby increased by \$39,149.13.

CONTRACT TIME: The contract time is hereby increased by 365 days for Final.

III. JUSTIFICATION:**CONTRACT PRICE:**

As of approved Pay Application #25 dated through 3/31/20 the balance of the current billable amount is \$145.95. The actual amount of remaining work exceeds this amount due to:

- Additional bollards requested by FPL to protect their equipment
- Remainder of As-built work needed for completion of project
- Post Construction video

These items will result in a \$6,576.40 overrun of the current contract value.

Additional work not included in the original scope of the contract is necessary for the completion of the project including:

1. Rework of FPL conduit at revised pole locations – The undergrounding includes the transition from above ground to underground FPL facilities on the various side streets. FPL installed several new poles in these locations to accommodate the transitions. Due to field conditions, some of the poles were installed in different locations than originally planned for during the initial installation of the conduit. The revised pole locations require the rework of the conduit. See attached \$25,232.73 proposed change order from the Contractor dated 3/10/20.

2. Additional survey services – Additional surveying services are required to complete the project. The City requested the Contractor to utilize his survey subcontractor to prepare four legal descriptions and sketches for easements that had not been acquired previously. FPL required specific as-built sketches for all of the equipment to verify the location of such within the easements and staking of the easements in the field were necessary for FPL field review. The cost of these additional services are \$7,340.00.

CONTRACT TIME:

This contract has been purposely kept active to allow for the completion of the remaining work and additional work that may be necessary. An additional 365 days will allow the contract to extend until July 11, 2020. All work necessary for the utility companies to finish their undergrounding work is expected to be completed by that day.

- IV. PAYMENT: Payment for the additional work will be paid for upon completion of the additional work per the Contract. The contract retainage will be maintained at \$5,000.00 until all work is completed.

Acknowledgments:

The aforementioned change, and work affected thereby, is subject to all provisions of the original contract not specifically changed by this Change Order;

It is expressly understood and agreed that the approval of the Change Order shall have no effect on the original contract other than matters expressly provided herein;

The prices quoted are fair and reasonable and in proper ratio to the cost of the original work contracted for under competitive bidding; and,

The change in price and/or delivery date described is considered to be fair and reasonable and has been mutually agreed upon in full agreement and final settlement of all claims arising out of this modification including all claims for delays and disruptions resulting from, caused by, or incident to such modifications and change orders.

RECOMMENDED BY:

Mead & Hunt
(Engineer)

By:  4/15/20
(Authorized Signature) (Date)

David King, P.E.,
Name Typed

APPROVED BY:

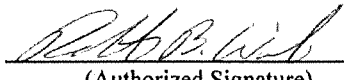
City of Holly Hill
Owner

By: _____
(Authorized Signature) (Date)

Joseph A. Forte, City Manager
Name Typed

ACCEPTED BY:

Carter Electric Company, Inc.
(Contractor)

 4-15-2020
(Authorized Signature) (Date)

Robert B. Wiech
Name Typed

END OF SECTION



carter electric company, inc.

contractors – engineers

231 JEAN STREET • DAYTONA BEACH, FLORIDA 32114-4197

EC0000265
EC0002058

TELEPHONE: 386/255-1418
FAX: 386/255-3429
www.carterelectric.com

PROPOSED CHANGE ORDER

Client Address:

Mead & Hunt

Contact: David King
4401 Eastport Parkway
Port Orange, FL 32127

CCN # 15
Date: 3/10/2020
Project Name: Holly Hill Utility Undergr
Project Number: 1404
Page Number: 1

Work Description

A. REWORK CONDUIT LOCATIONS TO NEWLY INSTALLED FPL POLES

1. FPL pole holding allowance if required, will be credited if not needed
2. Relocation of conduits to new pole locations
3. Asphalt cutting and patching
4. concrete cutting and patching
5. Directional bore 1-6" conduit 100' on the west side of 2nd street
6. Update the surveys and asbuilts
7. Traffic Control

NOTE: THIS ELECTRICAL PROPOSAL IS BASED ON ACTUAL MATERIAL QUANTITIES AS DETAILED BELOW.

B. ITEMS INCLUDED IN PROPOSAL ARE AS FOLLOWS:

1. State sales tax on material and equipment costs.
2. Project Supervision.
3. Rental Equipment Cost.
4. Personal Protective Equipment for our employees.

C. EXCLUDED ITEMS FROM THIS PROPOSAL ARE AS FOLLOWS:

1. Premium time, weekends, holidays, and overtime.

D. TERMS:

1. We reserve the right to correct this quote for errors and omissions.
2. This quote is good for acceptance within 30 days from the date of noted above.
3. We request a time extension of (5) additional days to complete this additional work.

Itemized Breakdown

Description	Qty	Total Mat.	Total Hrs.
2" CONDUIT - PVC40 FPL FURNISHED	100	0.00	0.00
2 x 24" RAD ELBOW 90 DEG - PVC40 FPL FURNISHED	12	0.00	0.00
2" COUPLING - PVC FPL FURNISHED	28	0.00	0.00

ORIGINAL

Attachment: Change Order #4 (2020-R-23 : REG MTG - OH to UG Primary Relocate Project - Change Order #4)

PROPOSED CHANGE ORDER

Client Address:

Mead & Hunt
4401 Eastport Parkway
Port Orange, FL 32127

CCN # 15
Date: 3/10/2020
Project Name: Holly Hill Utility Unde
Project Number: 1404
Page Number: 2

Description	Qty	Total Mat.	Total Hrs.
6" COUPLING - PVC FPL FURNISHED	3	0.00	0.00
REWORK 6-2"@ KRYSTAL	1	0.00	20.00
REWORK 4-4" @ OAKRIDGE	1	0.00	18.00
REWORK 1-6" 2ND STREET EASTSIDE	1	0.00	11.00
REWORK 6-2" 6TH ST EAST SIDE	1	0.00	23.00
REWORK 6-2" 7TH ST EAST SIDE	1	0.00	25.00
REWORK 6-2" 8TH ST WEST SIDE	1	0.00	24.00
REWORK 1-6" 6TH ST WEST SIDE	1	0.00	24.00
REWORK 1-6" 2ND ST WEST SIDE	1	0.00	13.00
Totals	151	0.00	158.00

Summary

Direct Labor		10,388.50
TRAFFIC CONTROL (1.00 @ 8.00 @ \$250.00 + 0.000 % + 0.000 % + 0.000 %)		2,000.00
FPL POLE HOLDING FEES (1.00 @ 1.00 @ \$2,500.00 + 0.000 % + 0.000 % + 0.000 %)		2,500.00
ASBUILT SURVEY REVISIONS (1.00 @ 8.00 @ \$600.00 + 0.000 % + 0.000 % + 0.000 %)		4,800.00
DUMP FEES (1.00 @ 1.00 @ \$200.00 + 0.000 % + 0.000 % + 0.000 %)		200.00

Subtotal		19,888.50
Markup (@ 10.000 %)		1,988.85

Subtotal		21,877.35
ASPHALT PATCHING (\$1,005.60 + 0.000 % + 0.000 % + 5.000 %)		1,055.88
CONCRETE SIDEWALK (\$500.00 + 0.000 % + 0.000 % + 5.000 %)		525.00
6" BORE @ 2ND ST 100' (\$1,690.00 + 0.000 % + 0.000 % + 5.000 %)		1,774.50

Subtotal		25,232.73
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Final Amount		\$25,232.73
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CONTRACTOR CERTIFICATION

Name:	<u>Robert B. W. cd</u>
Date:	<u>4-15-2020</u>
Signature:	<u>[Signature]</u>
I hereby certify that this quotation is complete and accurate based on the information provided.	

CLIENT ACCEPTANCE

CCN #:	15
Final Amount:	\$25,232.73
Name:	_____
Date:	_____
Signature:	_____
Change Order #:	_____
I hereby accept this quotation and authorize the contractor to complete the above described work.	

Attachment: Change Order #4 (2020-R-23 : REG MTG - OH to UG Primary Relocate Project - Change Order #4)

ORIGINAL



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Resolution**

MEETING DATE: May 12, 2020
FROM: Joseph Forte
SUBJECT: A Resolution of the City Commission of the City of Holly Hill, Florida, Approving a Proportionate Fair Share Agreement with Fountainhead Developers, LLC, for the Development Located at 1200 Center Avenue, Holly Hill, Florida; Providing for Severability; Providing for Conflicting Resolution; and Providing for an Effective Date.
NUMBER: 2020-R-24
APPLICANT:
PLANNER:

DISCUSSION:

The Property located at 1200 Center Ave, has undergone rezoning by the City to authorize the redevelopment of the former Holly Hill Middle School site into a mixed-use corporate campus in accordance with the Fountainhead MPUD approved on March 30, 2017

The Owner has performed a Traffic Impact Analysis (“TIA”) of the existing road network in the vicinity of the Project in order to determine the availability of roadway capacity to serve the Project. The results of the TIA indicated that a proportionate fair share payment (“PFS Payment”) was required to ensure that the Project mitigates any traffic concurrency deficiency and has sufficient roadway capacity to serve the traffic demand created by the phased buildout of the Project.

This redevelopment project has vested trips that are exempt from the calculation of traffic concurrency and therefore must be offset from the cost of the PFS Payment. The City and Fountainhead have agreed to the allocation and preservation of exempt trips as set forth in the attached Agreement.

FISCAL

ANALYSIS:

EXHIBIT “A” describes the Projected trip allocations, exempt trip allocations and the net Proportionate Fair Share liability for each parcel.

STAFF

RECOMMENDATION:

Asking the City Commission to approve the Proportionate Fair share Agreement as submitted by staff and authorize the Mayor to execute the Agreement.

COMMISSION

GOAL:

Goal #3: Implement the CRA master plan with a focus on the best utilization of vacant properties and blighted properties in the city. Attention should also focus on infrastructure improvements within the district and strategies to encourage private investment and business retention.

MOTION:

Approve the attached Proportionate Fair Share Agreement between the City of Holly Hill and the Fountainhead Developers and authorize the Mayor to execute the Agreement.

ATTACHMENTS:

- Proportionate Fair Share Agreement, Fountainhead 5-12-2020 (PDF)

Resolution No. 2020-24**A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, APPROVING A PROPORTIONATE FAIR SHARE AGREEMENT WITH FOUNTAINHEAD DEVELOPERS, LLC, FOR THE DEVELOPMENT LOCATED AT 1200 CENTER AVENUE, HOLLY HILL, FLORIDA; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTING RESOLUTION; AND PROVIDING FOR AN EFFECTIVE DATE.**

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA, APPROVING A PROPORTIONATE FAIR SHARE AGREEMENT WITH FOUNTAINHEAD DEVELOPERS, LLC., FOR THE DEVELOPMENT LOCATED AT 1200 CENTER AVENUE, HOLLY HILL, FLORIDA; PROVIDING FOR SEVERABILITY; PROVIDING FOR CONFLICTING RESOLUTIONS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, in connection with the site plan review, the Owner has performed a Traffic Impact Analysis (“TIA”) of the existing road network in the vicinity of the Project in order to determine the availability of roadway capacity to serve the Project; and

WHEREAS, the results of the TIA indicated that a proportionate fair share payment (“PFS Payment”) was required to ensure that the Project mitigates any traffic concurrency deficiency and has sufficient roadway capacity to serve the traffic demand created by the phased buildout of the Project; and

WHEREAS, as a redevelopment project that has vested trips that are exempt from the calculation of traffic concurrency and therefore must be offset from the cost of the PFS Payment; and

WHEREAS, the City and Owner have agreed to the allocation and preservation of exempt trips as more particularly set forth herein and the manner in which such exempt trips should be offset against the PFS Payment.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF HOLLY HILL, FLORIDA:

SECTION 1. The City Commission hereby approves the Proportionate Fair Share Agreement attached for the property located at 1200 Center Avenue, Holly Hill, Florida 32117 and authorizes the Mayor to execute the agreement.

SECTION 2. If any section, subsection, sentence, clause, phrase, or portion of this Resolution, or application hereof, is for any reason held invalid or unconstitutional by any

Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or application hereof.

SECTION 3. That all resolutions made in conflict with this Resolution are hereby repealed.

SECTION 4. That this Resolution shall become effective immediately upon its adoption.

APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020.

FOUNTAINHEAD PROPORTIONATE FAIR SHARE AGREEMENT

THIS AGREEMENT is entered into by and between the following entities:

FOUNTAINHEAD DEVELOPERS, LLC, a Florida Limited Liability Company, (“Owner”), the record title property owner mailing address: 1200 Center Avenue, Holly Hill, Florida 32117, **CITY OF HOLLY HILL**, a Florida municipal corporation (“City”), mailing address: 1065 Ridgewood Avenue, Holly Hill, FL 32117.

WHEREAS, the Property has undergone rezoning by the City to authorize the redevelopment of the former Holly Hill Middle School site into a mixed-use corporate campus in accordance with the Fountainhead MPUD approved on March 30, 2017 and recorded at Official Records Book ____ Page ____ of the Official Records of Volusia County, Florida (the “Project”).

WHEREAS, in connection with the site plan review, the Owner has performed a Traffic Impact Analysis (“TIA”) of the existing road network in the vicinity of the Project in order to determine the availability of roadway capacity to serve the Project; and

WHEREAS, the results of the TIA indicated that a proportionate fair share payment (“PFS Payment”) was required to ensure that the Project mitigates any traffic concurrency deficiency and has sufficient roadway capacity to serve the traffic demand created by the phased buildout of the Project; and

WHEREAS, as a redevelopment project that has vested trips that are exempt from the calculation of traffic concurrency and therefore must be offset from the cost of the PFS Payment; and

WHEREAS, the City and Owner have agreed to the allocation and preservation of exempt trips as more particularly set forth herein and the manner in which such exempt trips should be offset against the PFS Payment; and

NOW THEREFORE, in consideration of the mutual promises and covenants contained herein, and with the intent to be legally bound and to bind their successors and assigns, the Owner and City do hereby agree as follows:

1. The recitals set forth above are true and correct, form a material part of this Agreement, and are incorporated herein by reference.
2. Calculation of PFS Payment Due: In order to address roadway improvements required to address the new roadway impacts of the project and satisfy traffic concurrency requirements consistent with the requirements of City’s Land Development Code and the approved MPUD, the City and Owner agree as follows:
 - a. *PFS Payment Identified by Approved TIA.* A TIA was submitted and approved by the City on May 30, 2018. The TIA identified a PFS Payment for the phased buildout of the overall Project totaling \$760,477.23. Based on the trip generation

of 3,287 average daily trips anticipated for the Project at full buildout, the PFS Payment can be allocated on a per-trip basis by dividing the PFS Payment by the total number of net external daily trips anticipated to be generated by the Project at buildout (the “PFS Trip Cost”). Based on the foregoing calculation, each trip generated by the Project is allocated a PFS Trip Cost of \$231.36.

- b. *Calculation of Exempt Trips.* While the PFS Payment calculated by the TIA reviewed the anticipated traffic impacts of the Project buildout, it did not take into account that the Project is redeveloping property that was vested for a certain number of trips by the MPUD for purposes of concurrency. Vesting occurs when prior development present on a particular property generated trips which were previously present in the road network. In order to accurately assess the costs of meeting concurrency in the context of the redevelopment of previously developed property, the number of exempt trips generated by the prior development must be accounted for and subtracted from the overall impacts of the redevelopment project. For the Project, Exhibit F to the MPUD identifies 116,312 square feet of prior school development that was present on the property and allocated a road impact fee exemption value of \$510,609.68 to the prior development. While the MPUD expressed the exemptions in terms of the cash value of the impact fees, for purposes of concurrency, the exemptions should be expressed in terms of exempt trips. In addition, while the MPUD calculated impact fees exemptions based on applying the Institute of Transportation Engineer’s (ITE) classification #522 for a child care facility, the City and Owner agree that the trip generation rate for a middle school is more accurate given the prior use of the Property. The corresponding trip generation rate for a middle school based on the ITE 10th Edition is 20.17 average daily trips per 1,000 square feet. Applying that rate to the amount of development that was previously present on the property, the number of exempt average daily trips is 2,346.
- c. *Allocation of Exempt Trips to Project.* The MPUD property is currently divided into four (4) parcels that are approved for development in accordance with the MPUD. In accordance with Paragraph 17(B) of the MPUD, for purposes of the allocation of exempt trips to the MPUD property, the City and Owner agree that none of the exempt trips will be allocated to Parcel 4, which is planned for development as an affordable multi-family housing development. City and Owner agree that the exempt trips shall otherwise be allocated as provided herein and shown on Exhibit “A”:
 - i. The TIA showed a total external trip generation of 3,287 average daily trips for the uses included in the approved MPUD.
 - ii. Based on the calculation of exempt trips provided in paragraph 2(c), above, there are 2,346 exempt trips that are exempt from the PFS Payment.
 - iii. The City and Owner agree that the exempt trips should be allocated between Parcels 1, 2 and 3, as provided by the MPUD Development Agreement. Parcel 4 is approved for multi-family development and accounts for 590 daily trips based on the TIA. None of the exempt trips will be allocated to

Parcel 4 and the multi-family development will be required to pay its PFS Payment as shown on Exhibit “A”

- iv. All remaining exempt trips shall be allocated as provided on Exhibit “A”. Once the Owner closes on the acquisition of Parcels 1, 3 or both, the allocation of exempt trips by parcel shall terminate for the parcels owned by Owner and the Owner may allocate the remaining exempt trips to any portion of the MPUD property it owns as needed to account for the development of the Project. In the event Owner acquires Parcels 1, 3 or both and has exempt trips remaining on Parcels 1, 2 or 3 at the time development proceeds on Parcel 4, the Owner may, in its sole discretion, choose to transfer exempt trips to Parcel 4.
 - v. Any PFS Payment balance that is outstanding and not offset by exempt trips shall increase on an annual basis based on the percentage of the previous year annual Florida Department of Transportation Producer Price Index for Highway and Street Construction or successor construction cost index. The annual increase shall be no less than 3% and no more than 8% depending on the above referenced index. Increases in the outstanding Proportionate Fair Share balance shall be calculated based on the Effective Date of this Agreement, as defined below. Once the exempt trips for any parcel or combination of parcels are used in support development, the PFS Payment due for the number of non-exempt trips associated with a particular phase of development shall be paid upon application for a building permit authorizing construction of any improvements for that phase of development that includes non-exempt trips.
3. Effective Date. The effective date of this Agreement shall be the last date upon which all parties hereto cause this Agreement to be executed as indicated below their respective signatures.
 4. Binding Nature of this Agreement. This Agreement shall inure to the benefit of the parties hereto and the subject property, and shall be binding upon any person, firm, or corporation that may become a subsequent owner, successor in interest or assign, directly or indirectly, of the subject property or any portion thereof.
 5. Venue. In the event of any claim, action, litigation or proceeding under this Agreement, venue shall be in Volusia County, State of Florida.
 6. Recordation. This Agreement will be recorded in the Public Records of Volusia County, Florida, at Owner’s expense.
 7. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument. The electronic (i.e. facsimile or email) transmittal of an executed copy of this Agreement shall be deemed valid as if an original signature was delivered.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed on behalf of the respective entities, their successors and assigns.

[Signature blocks continued on next page]

Signed, sealed and delivered in the presence of:

THE CITY OF HOLLY HILL,
FLORIDA, a Florida municipal corporation

Witness 1

By _____
Chris Via, Mayor of City of Holly Hill

Print Name of Witness 1

Attest:

Witness 2

By: _____
Valerie Manning City Clerk

Print Name of Witness 2

Date: _____

STATE OF FLORIDA
COUNTY OF VOLUSIA

The foregoing instrument was acknowledged before me this _____ day of _____, 2020 by Chris Via and Valeria Manning, Mayor and City Clerk, respectively, of City of Holly Hill, Florida, a chartered municipal corporation, on behalf of the City. They are personally known to me and did not take an oath.

Notary Public

Commission No: _____

Approved as to legal form by:

By: _____
_____, City Attorney

Date: _____

Signed, sealed and delivered in the presence of: Fountainhead Developers, LLC, a Florida Limited Liability Company

Witness 1

By:_____

Print Name of Witness 1

Name:_____

Title:_____

Witness 2

Date: _____

Print Name of Witness 2

[Corporate Seal]

STATE OF FLORIDA
COUNTY OF VOLUSIA

The foregoing instrument was acknowledged before me this _____ day of _____, 2020, by _____ as _____ of FOUNTAINHEAD DEVELOPERS, LLC referred to in this agreement as "Owner." He or she is ☐ personally known to me or ☐ produced as identification and did not take an oath.

Notary Public
Commission No: _____

EXHIBIT "A"

Project Trip Allocation, Exempt Trip Allocation and Net PFS Liability by Parcel

	A	B	C	
	Total Trips per 5/18 LTG Traffic Impact Analysis	Exempt Trips per Allocation of Prior Middle School Trips	Net PFS Liability per Parcel (Total Trips- Exempt Trips (\$231.36)=Net PFS Liability per Parcel)*	
Parcel 1	876	643	\$53,906.88	
Parcel 2	1,386	1,386	\$0	
Parcel 3	<u>435</u>	317	<u>\$27,300.48</u>	
Parcel 4	<u>590</u>	<u>0</u>	<u>\$136,502.40</u>	
Total	3,287	2,346	\$217,709.76	

* The Net PFS Liability is based on the calculations reflected in the May 2018 TIA and is subject to an annual adjustment as provided in paragraph 2(c)(v) of this Agreement.



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Ordinance**

MEETING DATE: May 12, 2020
FROM: Brian Walker
SUBJECT: 1541 Garden Avenue - an Ordinance of the City of Holly Hill, Florida Amending, the Land Development Regulations, by Amending the Official Zoning Map to Designate the Property Described in Exhibit a from R-3 (Medium Density Single Family Residential) to Cc-1 (Commercial Corridor District); Providing for Conflicting Ordinances; Providing for Severability; and Providing an Effective Date.
NUMBER: 2020-O-3026
APPLICANT: Brian Walker
PLANNER:

TITLE

1541 Garden Avenue Rezone - Kenco Sign & Awning, LLC - Consider a rezone from R-3 (Medium Density Single-Family Residential) to CC-1 (Commercial Corridor District) for approximately .3444 acres, located on the southeast corner of Garden Avenue and Eleanor Street; (Z2020-01) (Raymond Webb, Applicant) District 4 (Commissioner Roy Johnson) (Brian Walker, City Planner)

BACKGROUND

The Applicant is requesting a rezone from R-3 (Medium Density Single-Family Residential) to CC-1 (Commercial Corridor District) for approximately .3444 acres. The R-3 zoning district is a residential zoning district that has a primary use of single-family homes and related accessory uses. The CC-1 zoning district is a commercial district allowing a wide variety of commercial, retail and light industrial uses. The applicant is requesting the rezone in order to utilize the subject property for light industrial activities related to an existing sign manufacturing operation that abuts the property.

The future land use designation of the land is Wholesale Commercial and Industrial and the requested zoning district is compatible with the existing future land use.

The zoning and future land uses (FLU) surrounding the subject property are as follows:

North - A self-storage facility with CC-1 zoning and Wholesale Commercial and Industrial FLU

South - A sign manufacturing facility with CC-1 zoning and Wholesale Commercial and Industrial FLU

East - A single-family home and a sign manufacturing facility with R-3 and CC-1 zoning and Wholesale Commercial and Industrial FLU

West - A single-family home used as a business and vacant lots with CC-1 zoning and Wholesale Commercial and Industrial FLU

SITE ANALYSIS

Floodplain _____ Impacts:

Based on the 2017 FIRM map, the subject property is not flood prone.

Wetland Impacts:

Based on preliminary aerial photo and wetland map analysis, there do not appear to be any wetlands on the subject property.

Endangered and Threatened Wildlife:

Based on a preliminary analysis, there do not appear to be any endangered or threatened wildlife on the subject property.

Utilities:

Water and sewer utilities are provided by the City of Holly Hill and are available to the site.

Transportation / Traffic:

The subject site currently accesses onto Garden Avenue.

Community Redevelopment Area:

The property is located within the City's Community Redevelopment Area.

Buffers and Landscaping:

Buffers and landscaping will be required in accordance with Chapter 98 of the Land Development Regulations of Holly Hill.

Sidewalks:

There are no sidewalks in this section of Garden Avenue and there are no sidewalks on Eleanor Street.

Consistency with the Land Development Code

The requested CC-1 (Commercial Corridor) zoning classification will recognize the current use

of the property as a commercial business site. Along Garden Avenue, 15 of 25 parcels have CC-1 zoning and all 25 have a Wholesale Commercial and Industrial FLU on the Future Land Use Map within the City's Comprehensive Plan.

The requested CC-1 zoning is consistent with the future land use designation of Wholesale Commercial and Industrial, and the trend of development along Garden Avenue and the surrounding area.

Consistency with the Comprehensive Plan

In accordance with FLU Policy 1.1.5 - In considering the rezoning of properties or the approval of site development plans, the City is both authorized and compelled to consider not only whether a particular proposal is consistent with the use and density aspects of the comprehensive plan, but also whether the proposal is consistent with the compatibility and other concerns of the plan. The rezone request has been evaluated for consistency with all applicable policies of the City's Comprehensive Plan.

Policy 1.1.2 - The Future Land Use Element Policy sets a maximum development intensity level of 1.95 FAR for sites with a general commercial future land use. The subject site is currently vacant. Any future development will be developed within this intensity level.

Policy 1.1.3 - The proposed CC-1 (Commercial Corridor) zoning district is consistent with the future land use map designation of wholesale commercial and industrial.

Staff finds the requested zoning classification to be consistent with the Comprehensive Plan.

BOARD OF PLANNING AND APPEALS RECOMMENDATION

At its meeting on Monday, May 4th, the Board of Planning and Appeals unanimously recommended approval of the request to adopt an Ordinance enacting a Rezone from R-3 (Medium Density Single-Family Residential) to CC-1 (Commercial Corridor District) for property totaling approximately .3444 acres, located on the southeast corner of Garden Avenue and Eleanor Street.

STAFF RECOMMENDATION

Staff recommends that the City Commission adopt the Ordinance enacting a Rezone from R-3 (Medium Density Single-Family Residential) to CC-1 (Commercial Corridor District) for property totaling approximately .3444 acres, located on the southeast corner of Garden Avenue and Eleanor Street.

ATTACHMENTS:

- Site Map (PDF)
- Aerial Map (PDF)
- Blowout Aerial (PDF)

- Area View of FLU (PDF)
- Area View of Zoning (PDF)
- Current FLU (PDF)
- Current Zoning (PDF)
- Looking East(PDF)
- Looking North (PDF)
- Looking Southeast (PDF)
- CC-1 Permitted Uses (PDF)
- R-3 Permitted Uses (PDF)
- Application (PDF)

Ordinance No. 2020-3026

1541 GARDEN AVENUE - AN ORDINANCE OF THE CITY OF HOLLY HILL, FLORIDA AMENDING, THE LAND DEVELOPMENT REGULATIONS, BY AMENDING THE OFFICIAL ZONING MAP TO DESIGNATE THE PROPERTY DESCRIBED IN EXHIBIT A FROM R-3 (MEDIUM DENSITY SINGLE FAMILY RESIDENTIAL) TO CC-1 (COMMERCIAL COORIDOR DISTRICT); PROVIDING FOR CONFLICTING ORDINANCES; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

AN ORDINANCE OF THE CITY OF HOLLY HILL, FLORIDA, AMENDING THE LAND DEVELOPMENT REGULATIONS, BY AMENDING THE OFFICIAL ZONING MAP TO DESIGNATE THE PROPERTY DESCRIBED IN EXHIBIT A FROM R-3 (MEDIUM DENSITY SINGLE FAMILY RESIDENTIAL) TO CC-1 (COMMERCIAL CORRIDOR DISTRICT); PROVIDING FOR CONFLICTING ORDINANCES; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Commission of the City of Holly Hill, Volusia County, Florida, has adopted a comprehensive plan pursuant to, and in compliance with 163.3161 et. Seq., Florida Statutes; and

WHEREAS, the City Commission, as authorized by 163.3202, Florida Statutes, has enacted and does enforce the Land Development Regulations, based on, related to, and as a means to implement its adopted comprehensive plan; and

WHEREAS, the City Commission has determined that it is necessary to amend its Land Development Regulations as herein provided in order to more effectively implement its adopted comprehensive plan; and

WHEREAS, the City Commission has determined that the proposed amendment to the Land Development Regulations is consistent with its adopted comprehensive plan.

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COMMISSION
OF THE CITY OF HOLLY HILL, FLORIDA:**

SECTION 1. The Official Zoning Map of the City of Holly Hill is hereby amended to designate the property described in Attachment “A” as CC-1 (Commercial Corridor District.)

SECTION 2. Development of the property described in Attachment “A” shall conform to the Land Development Regulations of Holly Hill.

SECTION 3. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance, or application hereof, is for any reason held invalid or unconstitutional by any Court, such portion or application shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions or application hereof.

SECTION 4. That all ordinances made in conflict with this Ordinance are hereby repealed.

SECTION 5. That this Ordinance shall become effective immediately upon its adoption.

**APPROVED AND AUTHENTICATED on this 12th day of MAY, 2020 for
first reading.**

ATTACHMENT “A”

LEGAL DESCRIPTION:

Lot 3, except the easterly 25 feet, thereof, Block 3, Pine Cluster, as per map recorded in Plat Book 21, page 94 of the Public Records of Volusia County,

Florida, and Lot 4, Block 3, Pine Cluster, as per map recorded in Plat Book 21, page 94 of the Public Records of Volusia County, Florida, and the northerly one half of Lot 23 and all Lot 24, Block 3, Pine Cluster, as per map recorded in Plat Book 21, page 94 of the Public Records of Volusia County, Florida.

Site Map



Aerial



Aerial of the Area

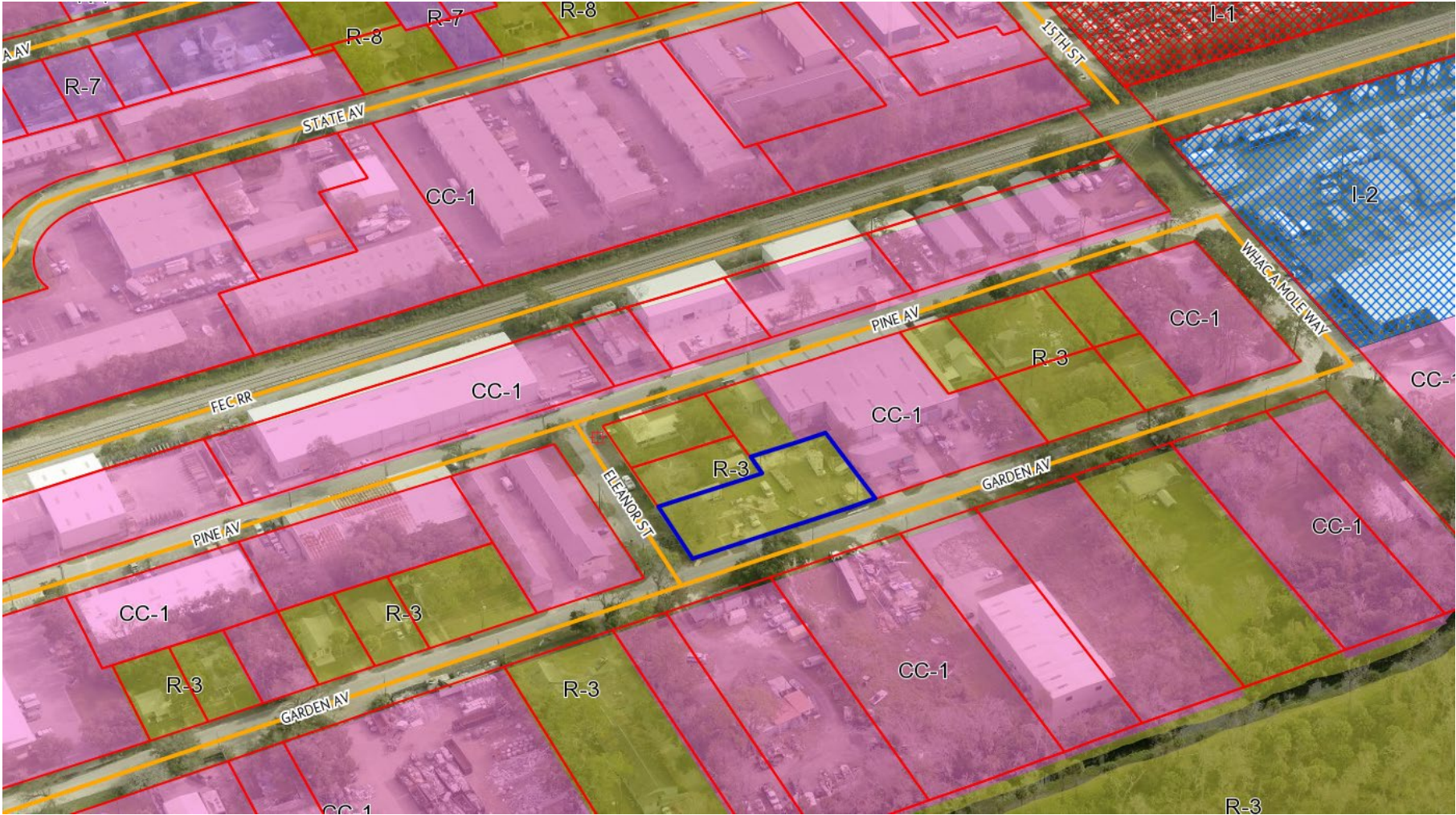


Area View of Surrounding Future Land Uses

- Low Density Single Family Residential
- Low-Medium Density Residential
- Medium Density Residential
- High Density Residential
- Mobile Home Residential
- Mixed Use II
- Mixed Use III
- Residential-Based Mixed Use
- General Retail Commercial
- Wholesale Commercial & Industrial
- Churches Schools & Institutions
- Parks and Open Space
- Conservation
- No City Future Land Use



Area View of Surrounding Zoning

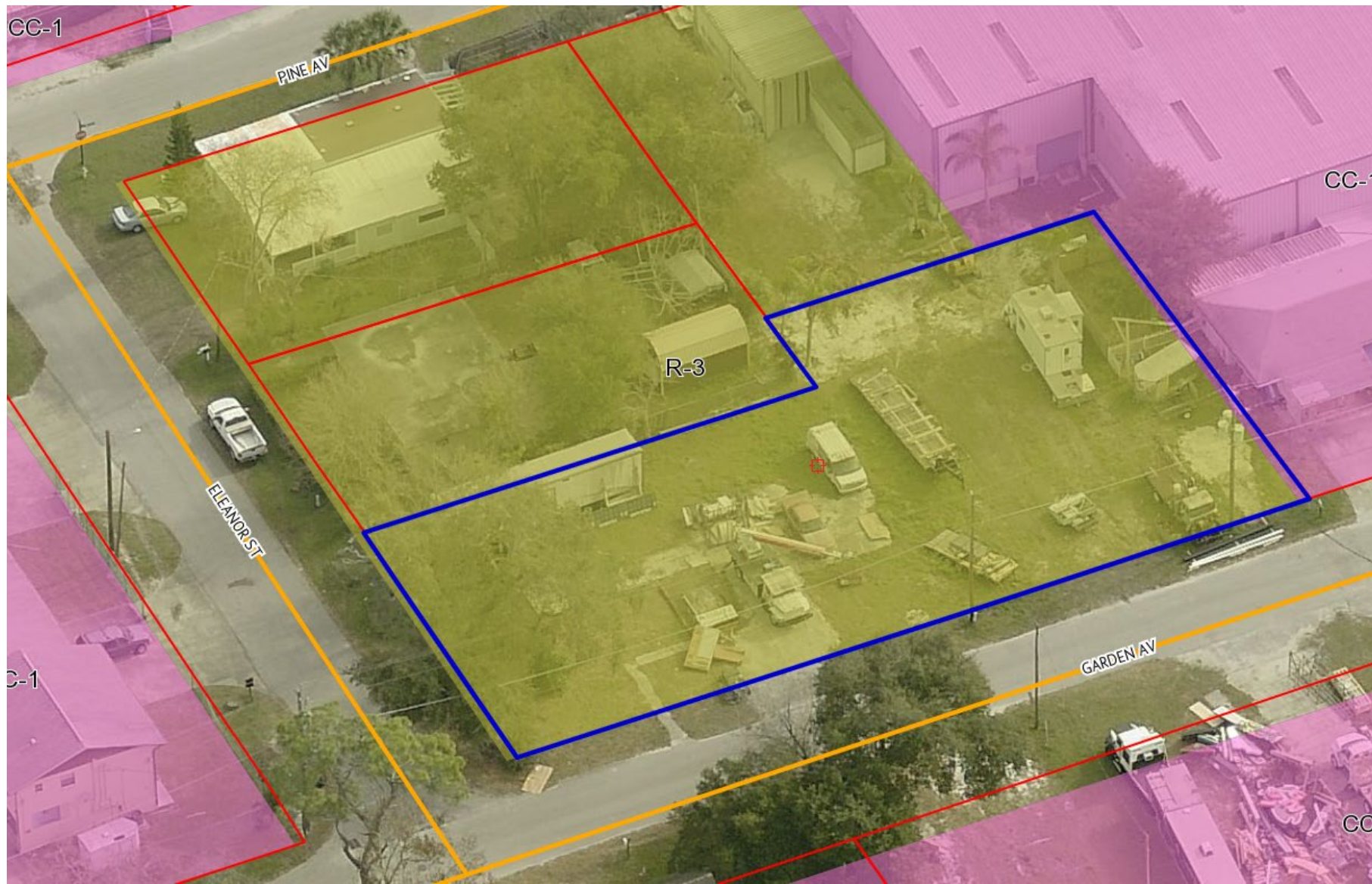


Attachment: Area View of Zoning (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning,

Wholesale Commercial and Industrial Future Land Use



R-3 Zoning



Property Looking East on Garden Ave



Property Looking North on Garden



Property Looking Southeast at Corner of Garden Ave and Eleanor Street



Sec. 114-593. - Permitted principal uses and structures.

Permitted principal uses and structures in the CC-1 district are as follows:

- (1) Administrative offices.
- (2) Adult congregate living facilities not exceeding 65 clients per acre (licensed capacity).
- (3) Adult day care centers.
- (4) Banks and savings and loans.
- (5) Barbershops.
- (6) Bars and nightclubs, except when such uses are located on a parcel abutting any R-1 through R-9 zoned property.
- (7) Beauty salons.
- (8) Business services.
- (9) Carwash facilities, except when located on property adjacent to Ridgewood Avenue or LPGA Blvd., in which case such use is allowed by special exception.
- (10) Child day care centers.
- (11) Civic, fraternal and service organizations.
- (12) Clubs, private.
- (13) Convenience grocery stores.
- (14) General office uses.
- (15) Hospitals.
- (16) Hotels/motels.
- (17) Houses of worship.
- (18) Laboratories: biological, optical, medical, dental and X-ray, but not including research and development laboratories related to the manufacturing of drugs for distribution and sale.
- (19) Manufacturing (light industrial).
- (20) Marinas.
- (21) Medical and dental clinics.
- (22) Miniwarehouses.
- (23) Motor vehicle sales and rentals.
- (24) Newsstands.
- (25) Personal services.
- (26) Prescription pharmacies.
- (27) Professional services offices.
- (28) Public uses.
- (29) Public utility uses and structures.
- (30) Recreational vehicles and equipment sales (including boat sales).
- (31) Residential dwelling units (not more than ten dwelling units per acre in conjunction with a nonresidential use only).
- (32) Rest and convalescent homes.

- (33) Restaurants, type A or B, except when such uses are located on a parcel abutting any R-1 through R-9 zoned property.
- (34) Retail sales and services.
- (35) Retail specialty shops.
- (36) Self-service laundromats.
- (37) Shopping centers.
- (38) Veterinary clinics.
- (39) Warehousing and distribution.
- (40) Motor vehicle and marine sales, services, parts and repair.
- (41) Paint and body shops, except when such uses are located on a parcel abutting Ridgewood Avenue (U.S. 1/S.R. 5) or abutting any R-1 through R-9 zoned property.

The development code administrator and the city planner may jointly authorize any use which is similar in character to any listed permitted use and which is clearly within the legislative intent of the classification.

(Ord. No. 2408, § 1(5.5.21.C), 8-8-95; Ord. No. 2416, § 1, 10-10-95; Ord. No. 2817, § 2, 10-9-07)

Sec. 114-594. - Prohibited uses.

The following uses are prohibited in the CC-1 district:

- (1) Asphalt batching plants.
- (2) Blood plasma centers.
- (3) Bulk storage of petroleum products and other flammable substances.
- (4) Concrete plants.
- (5) Truck and automobile salvage yards.
- (6) Temporary labor halls and similar uses, but not including employment services.
- (7) Tattoo parlors, except that tattoo parlors shall be permitted on CC-1 zoned property only within the redevelopment district overlay if approved by special exception.

(Ord. No. 2408, § 1(5.5.21.D), 8-8-95; Ord. No. 2460, § 1, 3-25-97; Ord. No. 2999, § 2, 3-13-18)

Sec. 114-595. - Permitted accessory uses and structures.

Permitted accessory uses and structures in the CC-1 district are as follows:

- (1) Advertising signs, subject to the provisions of chapter 110.
- (2) Uses customarily associated with, dependent on and incidental to the permitted principal use.
- (3) Outside display, storage or sale of goods and objects that are customarily associated with and incidental to a permitted principal use. (Refer to section 114-767.)

(Ord. No. 2408, § 1(5.5.21.E), 8-8-95)

Sec. 114-596. - Special exceptions.

Special exceptions in the CC-1 district are as follows:

- (1) Automobile service stations (type A and B) (Refer to section 114-682.)
- (2) Bars and nightclubs, when such uses are located on a parcel abutting any R-1 through R-9 zoned property. (Refer to section 114-691.)
- (3) Fence manufacturing and assembly. (Refer to section 114-684.)
- (4) Flea markets and farmers' markets. (Refer to section 114-676.)
- (5) Restaurants, types A and B, when such uses are located on a parcel abutting any R-1 through R-9 zoned property. (Refer to section 114-690.)
- (6) Self-service automobile fuel stations and accessory self-service fuel pumps. (Refer to section 114-682.)
- (7) Transmission repair services. (Refer to section 114-681.)
- (8) Truck and rail freight terminals.

(Ord. No. 2408, § 1(5.5.21.F), 8-8-95)

Sec. 114-152. - Permitted principal uses and structures.

Permitted principal uses and structures in the R-3 district are as follows:

- (1) Single-family dwelling units.
- (2) Public parks, playgrounds, playfields, recreation buildings and facilities owned and operated by federal, state, county or municipal governments.
- (3) Golf courses.
- (4) Approved home occupations.
- (5) Essential utility uses and structures.

(Ord. No. 2352, § 2(5.5.5.B), 7-13-93)

Sec. 114-153. - Permitted accessory uses and structures.

Permitted accessory uses and structures in the R-3 district are as follows: uses customarily associated with, dependent on and incidental to the permitted principal use.

(Ord. No. 2352, § 2(5.5.5.C), 7-13-93)

Sec. 114-154. - Special exceptions.

Special exceptions in the R-3 district are as follows:

- (1) Houses of worship. (Refer to section 114-666.)
- (2) Public schools. (Refer to section 114-662.)
- (3) Cemeteries. (Refer to section 114-664.)
- (4) Adult congregate living facilities. (Refer to section 114-665.)

(Ord. No. 2352, § 2(5.5.5.D), 7-13-93)

HOLLY HILL RECEIVED

AUG 23 2019

COMM. DEV. DEPT.

**REZONE/ FUTURE LAND USE AMENDMENT**

1065 Ridgewood Avenue, Holly Hill, Florida 32117-2807

Phone: (386) 248-9424 Fax: (386) 248-9498 Permitdesk@hollyhillfl.org

Date Received: _____ Application ID: _____ Submitted By: _____

(20-156)

PROJECT INFORMATION:

PROJECT NAME: Kenco Rezone
 PARCEL ID #(S): 4242-3703-0240
 LOCATION: 1541 Garden Ave.
 EXISTING USE(S): Vacant
 PROPOSED USE(S): Manufacturing & repair of signage
 TOTAL ACREAGE: .3444 (approx 15,000 sq. ft.)
 WATER PROVIDER: _____ SEWER PROVIDER: _____
 PRIVATE WELL _____ PRIVATE SEPTIC _____
 CURRENT ZONING: R-3 PROPOSED ZONING: CC-1
 CURRENT FUTURE LAND USE: Wholesale Comm and Industrial PROPOSED FUTURE LAND USE: Same

APPLICANT INFORMATION:

Name: Raymond Webb E-Mail: molly@Kenco2000inc.com
 Address: 1539 Garden Ave Phone: 386 672 1590
 Company: Kenco Sign & Awning LLC Fax: 386 677 2910
☒ Owner ☐ Agent for Owner ☐ Attorney for Owner 386-527-6506

OWNER INFORMATION:

Name: LED Partners Florida LLC E-Mail: molly@Kenco2000inc.com
 Address: 1539 Garden Ave. Phone: 386 672 1590
 Fax: 386 677 2910

CONSULTANT INFORMATION:

Name: _____ E-Mail: _____
 Address: _____ Phone: _____
 Company: _____ Fax: _____

WHO SHOULD ALL COMMUNICATION BE DIRECTED TO?

☒ APPLICANT ☐ OWNER ☐ CONSULTANT

Attachment: Application (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning, LLC)

APPLICATION TYPE(S)/FEE(S)***LAND USE AMENDMENT**

- ☐ LARGE SCALE FUTURE LAND USE AMENDMENT (>10 ACRES) \$3,000.00
- ☐ SMALL SCALE FUTURE LAND USE AMENDMENT (≤10 ACRES) \$2,000.00

REZONE (NON-PD)

- ☒ STRAIGHT REZONE / LDR TEXT AMENDMENT \$1,200

REZONE (PD)

- ☐ PD REZONE \$2,000
- ☐ PD AMENDMENT \$1,250 (This does not mean changes in items such as uses or density but means minor changes in items such as layout and landscaping.)

***THERE MAY BE ADDITIONAL PASS-THROUGH FEES FOR REVIEWS DONE BY REVIEWERS OUTSIDE OF THIS AGENCY. ALL FEES ARE DUE AT THE TIME OF APPLICATION SUBMITTAL.**

ATTACHMENT CHECKLIST**REQUIRED SUBMITTALS**

- ☒ COPY OF PRE-APPLICATION COMMENTS. IF YOU HAVE NOT HAD A PRE-APPLICATION MEETING TO DISCUSS THIS PROJECT PLEASE CONTACT THE CITY PLANNER TO ARRANGE AN APPOINTMENT AT 386-248-9492.
- ☐ A CD OF ALL ITEMS SUBMITTED
- ☒ APPLICATION
- ☐ APPLICATION FEE
- ☒ PROOF THAT TAXES ARE CURRENT
- ☒ PROPERTY APPRAISER'S PROPERTY INFORMATION PRINTOUT
- ☒ OWNERSHIP DISCLOSURE FORM (ADD'L DOCUMENTATION MAY REQUIRED IF OWNER IS A TRUST OR CORPORATION)
- ☒ OWNER'S AUTHORIZATION FORM, IF APPLICABLE (ADD'L DOCUMENTATION REQUIRED IF OWNER IS A TRUST OR CORPORATION)
- ☒ 2 CURRENT SIGNED AND SEALED BOUNDARY SURVEYS
- ☒ LEGAL DESCRIPTION IN MS WORD FORMAT (EMAIL THIS TO THE CITY PLANNER)
- NA ☒ SCHOOL CAPACITY REVIEW – *IF PROPOSING OVER 10 RESIDENTIAL UNITS (CONTACT SCHOOL BOARD PLANNING & BUSINESS SERVICES AT 386-734-7190 FOR APPLICATION)*
- N/A ☒ TRAFFIC IMPACT ANALYSIS FOR PROJECTS GENERATING OVER 1000 TRIPS PER DAY ACCORDING TO RATES PUBLISHED BY THE INSTITUTE OF TRANSPORTATION ENGINEERS "TRIP GENERATION MANUAL" (LATEST EDITION)
- N/A ☒ DRAFT DEVELOPMENT ORDER IN MS WORD FORMAT (*PD REZONE ONLY – CONTACT THE CITY PLANNER*)
- N/A ☒ PRELIMINARY DEVELOPMENT PLAN (*PD REZONE ONLY - SEE CODE SEC. 114-771*)

Applicant's Signature:

(Signature)

(Date)

(Print)

Attachment: Application (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning, LLC)

Applications must be complete to initiate the preview process. For questions please contact the City Planner at (386) 248-9424, fax (386) 248-9498 or email at bwalker@hollyhillfl.org

CITY OF HOLLY HILL APPLICANT AUTHORIZATION FORM

(ORIGINAL ONLY)

An authorized applicant is:

- The property owner of record; or
- An agent of said property owner (power of attorney to represent and bind the property owner must be submitted with the application); or
- Contract purchaser (a copy of a fully executed sales contract must be submitted with the application containing a clause or clauses allowing an application to be filed).

I, Raymond Webb, the owner of record for the following described property (Legal Description or Tax/Parcel ID Number) 4242-3703-0240, 4242-3703-0030 hereby affirm that Molly McLaughlin is hereby designated to act as my authorized agent for the filing of the attached application for a: (CHECK ONE) 4242-3704-50

- ☐ Arbor Permit
 ☐ Special Exception
 ☐ Variance
 ☐ Development Plan
☐ Special Event Permit
 ☐ Vacate
 ☐ Sign
 ☒ Rezone/Comp Plan Amendment
☐ Other _____

and make binding statements and commitments regarding the request. I certify that I have examined the attached application and that all statements and diagrams submitted are true and accurate to the best of my knowledge. Further, I understand that this application, attachments and fees become part of the Official Records of City of Holly Hill, Florida and are not returnable.

Date

6/27/19

Owner's Signature

Raymond Webb

Owner's Name

Raymond Webb

STATE OF FLORIDA

COUNTY OF Volusia

SWORN TO AND SUBSCRIBED before me, an officer duly authorized in the State of Florida to take acknowledgements, personally appeared Raymond Webb, who is personally known to me or who has produced a _____ as identification and who executed the foregoing instrument and sworn an oath on this 27th day of June, 2019.

NOTARY PUBLIC

Kelly Minott





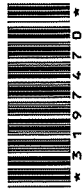
Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

VOLUSIA COUNTY TAX BILL
NOTICE OF AD VALOREM TAXES AND NON-AD VALOREM ASSESSMENTS
2018 Paid Individual Tax Certificate

9.1m

PROPERTY ADDRESS: 1545 GARDEN AV, HOLLY HILL, 32117

LEGAL DESCRIPTION: LOT 4 BLK 3 PINE CLUSTER FITCH GRANT HOLLY HILL PER OR 4095P
G 1905 & OR 5508 PG 0467 PER
See Additional Legal on Tax Roll



LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

PARCEL: 424237030040
ALTERNATE KEY : 3197470
MILLAGE CODE: 203
TAX YEAR: 2018

County of Volusia
Paid By Raymond Webb
07/11/2019
Receipt # WWW-18-0033781
\$249.87

CERTIFIED FUNDS ONLY

The taxes are delinquent. CERTIFIED FUNDS ONLY. A tax certificate may have been issued on this parcel. This could result in a tax deed sale for this parcel. Please contact the Volusia County Revenue Division.

WALK-IN CUSTOMERS PLEASE BRING ENTIRE NOTICE

TAXES BECOME DELINQUENT APRIL 1

Face: 232.02	Cert #7288	If Received By	Jul 31, 2019		
Rate: 5.75%	Bidder #7662	Please Pay	\$0.00		

AD VALOREM TAXES

TAXING AUTHORITY	MILLAGE	ASSESSED VALUE	EXEMPTION	TAXABLE VALUE	TAX AMOUNT
COUNTY	6.24640	4,550	0	4,550	28.42
VOLUSIA FOREVER	0.09940	4,550	0	4,550	0.45
VOLUSIA ECHO	0.20000	4,550	0	4,550	0.91
VOLUSIA FOREVER I&S 2005	0.10060	4,550	0	4,550	0.46
VOLUSIA COUNTY MOSQUITO CONTROL	0.18800	4,550	0	4,550	0.86
PONCE INLET PORT AUTHORITY	0.09290	4,550	0	4,550	0.42
SCHOOL	6.28100	5,292	0	5,292	33.24
HOLLY HILL	6.50000	4,550	0	4,550	29.58
ST JOHNS WATER MANAGEMENT DIST	0.25620	4,550	0	4,550	1.17
FLORIDA INLAND NAVIGATION DIST	0.03200	4,550	0	4,550	0.15
HALIFAX HOSPITAL AUTHORITY	0.35460	4,550	0	4,550	1.61

TOTAL MILLAGE RATE: 20.35110 **TOTAL TAXES:** \$97.27

NON-AD VALOREM ASSESSMENTS

LEVYING AUTHORITY	TELEPHONE	RATE PER UNIT	AMOUNT
HOLLY HILL STORMWATER	386-248-9433	@ 96.0000	96.00

TOTAL ASSESSMENTS: \$96.00

TOTAL COMBINED TAXES AND ASSESSMENTS: \$193.27

For additional information see reverse side.

Pay online at volusia.county-taxes.com

Phone: 386-736-5938
Revenue@volusia.org

RETURN WITH PAYMENT

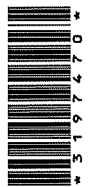
Make payment to:
COUNTY OF VOLUSIA
VOLUSIA COUNTY REVENUE DIVISION
123 W Indiana Ave Room 103
DeLand FL 32720

PAY IN U.S. DOLLARS DRAWN ON A U.S. BANK
LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

VOLUSIA COUNTY TAX BILL
2018 Paid Individual Tax Certificate

CERTIFIED FUNDS ONLY

PARCEL: 424237030040
ALTERNATE KEY : 3197470
TAX YEAR: 2018



PROPERTY ADDRESS:

1545 GARDEN AV, HOLLY HILL, 32117

TAXES BECOME DELINQUENT APRIL 1

Face: 232.02	Cert #7288	If Received By	Jul 31, 2019		
Rate: 5.75%	Bidder #7662	Please Pay	\$0.00		

Public Site

Paid 07/11/2019

Receipt # WWW-18-0033781

\$249.87



Mail payment to:
County of Volusia
Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

Phone: 386-736-5938
Email: Revenue@volusia.org

For office hours and locations, please visit volusia.org/revenue.

NOTE: Foreign checks not payable in U.S. dollars and drawn from a U.S. bank will be rejected and returned.

IMPORTANT INFORMATION - PLEASE READ

If this parcel has been sold, please send this bill to the new owner or return it to the Volusia County Revenue Division immediately.

If the tangible personal property has been sold, please contact the Volusia County Revenue Division immediately. If the tangible personal property taxes are not paid, the property will be subject to seizure and sale at auction.

Unpaid taxes become delinquent April 1.

On April 1, delinquent real estate parcels are assessed a minimum charge of 3% per Florida Statute.

Notice: delinquent real estate parcels will incur an advertising fee, auction listing fee, and a tax certificate will be sold by June 1. When a tax certificate has been sold, certified funds are required for payment.

The statement, "Prior year taxes are due. Please call (386) 736-5938.", indicates the parcel is delinquent.

The Volusia County Property Appraiser is responsible for the preparation of the current ad valorem tax roll, assessed value, exemptions, taxable value, assessed owner(s) name and mailing address, property address, and legal description. The Volusia County Property Appraiser's phone number is 386-736-5901 or email: vcpa@volusia.org.

The Volusia County Revenue Division is responsible for the preparation and mailing of tax notices based on information contained on the current tax roll certified by the Volusia County Property Appraiser and Non-Ad Valorem assessments provided by the levying authorities. The Volusia County Revenue Division phone number is 386-736-5938 or email: Revenue@volusia.org.

The Taxing Authorities are responsible for setting Ad Valorem Millage Rates.

The Levying Authorities are responsible for setting Non-Ad Valorem Assessments. (Phone number provided on front of bill.)

Partial payments of current year taxes are available. Partial payments are not eligible for discounts and incur a \$10 processing fee for each payment. For more information regarding partial payments, please call the Volusia County Revenue Division at 386-736-5938 or email: Revenue@volusia.org.

Important Dates to Remember:

March 1	Deadline to file for exemptions for next tax year with the Volusia County Property Appraiser.
March 31	Deadline for Working Waterfront, Affordable Rental Housing, or Homestead Tax Deferral Application for current tax roll.
March 31	Last day for full tax payment without penalty or to make a partial payment.
April 30	Deadline for new quarterly installment plan applications for the next tax year.

BillExpress™

Receive tax bills via email. (ebills)

Sign up for BillExpress™ online at volusia.county-taxes.com.
Multiple email accounts can be associated with one parcel.
Multiple parcels can be tied to one email.
For assistance with multiple parcels, please call the Volusia County Revenue Division at 386-736-5938 or email: Revenue@volusia.org.



Using an online bill pay service:

Create a payee for County of Volusia.
Use the alternate key number as the account number.
Mail payment to:
County of Volusia
Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

Pay Online

volusia.county-taxes.com

Payment options available online:

E-check:

Use a checking account for a nominal fee.

Debit or Credit Card:

A convenience fee is charged by a third party provider.
The fee is a percentage of the total amount due.
American Express, Discover, MasterCard, and Visa

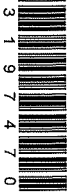


Volusia County Revenue Division
123 W Indiana Avenue Room 103
DeLand FL 32720

VOLUSIA COUNTY NOTICE OF AD VALOREM TAXES AND NON-AD VALOREM ASSESSMENTS REAL ESTATE REMINDER TAX BILL

9.1m

PROPERTY ADDRESS: 1545 GARDEN AV
HOLLY HILL 32117
LEGAL DESCRIPTION: LOT 4 BLK 3 PINE CLUSTER FITCH G
RANT HOLLY HILL PER OR 4095P
G 1905 & OR 5508 PG 0467 PER OR
7096 PG 2922 PER OR 7096 PG
2923



LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117



Pay Online

PARCEL:	424237030040
ALTERNATE KEY:	3197470
MILLAGE CODE:	203
TAX YEAR:	2018

Total: \$ 249.87

Pay online at volusia.county-taxes.com

WALK-IN CUSTOMERS PLEASE BRING ENTIRE NOTICE

IF RECEIVED BY:	Apr 30, 2019	May 31, 2019
PAY THIS AMOUNT:	199.07	222.07
FEES AND INTEREST:	Interest Added	Additional Fees

If a tax certificate is sold, certified funds are required for payment.

AD VALOREM TAXES

TAXING AUTHORITY	MILLAGE	ASSESSED VALUE	EXEMPTION	TAXABLE VALUE	TAX AMOUNT
COUNTY	6.24640	4,550		4,550	28.42
VOLUSIA FOREVER	0.09940	4,550		4,550	0.45
VOLUSIA ECHO	0.20000	4,550		4,550	0.91
VOLUSIA FOREVER I&S 2005	0.10060	4,550		4,550	0.46
VOLUSIA COUNTY MOSQUITO CONTRO	0.18800	4,550		4,550	0.86
PONCE INLET PORT AUTHORITY	0.09290	4,550		4,550	0.42
SCHOOL	6.28100	5,292		5,292	33.24
HOLLY HILL	6.50000	4,550		4,550	29.58
ST JOHNS WATER MANAGEMENT DIST	0.25620	4,550		4,550	1.17
FLORIDA INLAND NAVIGATION DIST	0.03200	4,550		4,550	0.15
HALIFAX HOSPITAL AUTHORITY	0.35460	4,550		4,550	1.61

TOTAL MILLAGE RATE: 20.35110

TOTAL TAXES: \$97.27

NON-AD VALOREM ASSESSMENTS

LEVYING AUTHORITY	TELEPHONE	RATE PER UNIT	AMOUNT
HOLLY HILL STORMWATER	386-248-9433	96.00	96.00

TOTAL ASSESSMENTS: \$96.00

TOTAL COMBINED TAXES AND ASSESSMENTS: \$193.27

For additional information please see reverse side.

Pay online at volusia.county-taxes.com

Phone: 386-736-5938
Email: Revenue@volusia.org

RETURN WITH PAYMENT

Make payment to: COUNTY OF VOLUSIA

Mail payment to:

COUNTY OF VOLUSIA
VOLUSIA COUNTY REVENUE DIVISION
123 W Indiana Avenue Room 103
DeLand FL 32720

PAY IN U.S. DOLLARS DRAWN ON A U.S. BANK

LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

VOLUSIA COUNTY REAL ESTATE REMINDER TAX BILL

PROPERTY ADDRESS: 1545 GARDEN AV
HOLLY HILL 32117

PARCEL:	424237030040
ALTERNATE KEY:	3197470
TAX YEAR:	2018

IF RECEIVED BY:	Apr 30, 2019	May 31, 2019
PAY THIS AMOUNT:	199.07	222.07
FEES AND INTEREST:	Interest Added	Additional Fees

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Payment must be received in a Revenue Division office by 5 PM
on the date corresponding to the "PAY THIS AMOUNT" box.
Postmark is not allowed for delinquent payments.



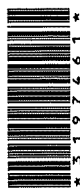
Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

VOLUSIA COUNTY TAX BILL
NOTICE OF AD VALOREM TAXES AND NON-AD VALOREM ASSESSMENTS
 2018 Paid Individual Tax Certificate

9.1.m

County of Volusia County of Volusia
Paid By Raymond Webb
07/10/2019 \$85.
Receipt # WWW-18-0033733

PROPERTY ADDRESS: ELEANOR ST, HOLLY HILL, 32117
LEGAL DESCRIPTION: LOT 3 EXC E 25 FT BLK 3 PINE CLUSTER FITCH GRANT HOLLY HILL
 PER OR 4321 PG 2910



LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

PARCEL:	424237030030
ALTERNATE KEY :	3197461
MILLAGE CODE:	203
TAX YEAR:	2018

CERTIFIED FUNDS ONLY

The taxes are delinquent. CERTIFIED FUNDS ONLY. A tax certificate may have been issued on this parcel. This could result in a tax deed sale for this parcel. Please contact the Volusia County Revenue Division.

WALK-IN CUSTOMERS PLEASE BRING ENTIRE NOTICE

TAXES BECOME DELINQUENT APRIL 1

Face: 75.61	Cert #7289	If Received By	Jul 31, 2019		
Rate: 8.75%	Bidder #529151	Please Pay	\$0.00		

AD VALOREM TAXES

TAXING AUTHORITY	MILLAGE	ASSESSED VALUE	EXEMPTION	TAXABLE VALUE	TAX AMOUNT
COUNTY	6.24640	2,275	0	2,275	14.21
VOLUSIA FOREVER	0.09940	2,275	0	2,275	0.23
VOLUSIA ECHO	0.20000	2,275	0	2,275	0.46
VOLUSIA FOREVER I&S 2005	0.10060	2,275	0	2,275	0.23
VOLUSIA COUNTY MOSQUITO CONTROL	0.18800	2,275	0	2,275	0.43
PONCE INLET PORT AUTHORITY	0.09290	2,275	0	2,275	0.21
SCHOOL	6.28100	2,646	0	2,646	16.62
HOLLY HILL	6.50000	2,275	0	2,275	14.79
ST JOHNS WATER MANAGEMENT DIST	0.25620	2,275	0	2,275	0.58
FLORIDA INLAND NAVIGATION DIST	0.03200	2,275	0	2,275	0.07
HALIFAX HOSPITAL AUTHORITY	0.35460	2,275	0	2,275	0.81

TOTAL MILLAGE RATE:

20.35110

TOTAL TAXES: \$48.64

NON-AD VALOREM ASSESSMENTS

LEVYING AUTHORITY	TELEPHONE	RATE PER UNIT	AMOUNT
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TOTAL ASSESSMENTS: \$0.00

TOTAL COMBINED TAXES AND ASSESSMENTS:	\$48.64
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For additional information see reverse side.

Pay online at volusia.county-taxes.com

Phone: 386-736-5938
Revenue@volusia.org

RETURN WITH PAYMENT

Make payment to:
COUNTY OF VOLUSIA
VOLUSIA COUNTY REVENUE DIVISION
123 W Indiana Ave Room 103
DeLand FL 32720

PAY IN U.S. DOLLARS DRAWN ON A U.S. BANK
LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

VOLUSIA COUNTY TAX BILL
2018 Paid Individual Tax Certificate

CERTIFIED FUNDS ONLY

PARCEL:	424237030030
ALTERNATE KEY :	3197461
TAX YEAR:	2018

PROPERTY ADDRESS:
ELEANOR ST. HOLLY HILL, 32117

TAXES BECOME DELINQUENT APRIL 1

Face: 75.61	Cert #7289	If Received By	Jul 31, 2019		
Rate: 8.75%	Bidder #529151	Please Pay	\$0.00		

Public Site

Paid 07/10/2019

Receipt # WWW-18-0033733

\$85.64



Mail payment to:
County of Volusia
Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

Phone: 386-736-5938
Email: Revenue@volusia.org

For office hours and locations, please visit volusia.org/revenue.

NOTE: Foreign checks not payable in U.S. dollars and drawn from a U.S. bank will be rejected and returned.

IMPORTANT INFORMATION - PLEASE READ

If this parcel has been sold, please send this bill to the new owner or return it to the Volusia County Revenue Division immediately.

If the tangible personal property has been sold, please contact the Volusia County Revenue Division immediately. If the tangible personal property taxes are not paid, the property will be subject to seizure and sale at auction.

Unpaid taxes become delinquent April 1.

On April 1, delinquent real estate parcels are assessed a minimum charge of 3% per Florida Statute.

Notice: delinquent real estate parcels will incur an advertising fee, auction listing fee, and a tax certificate will be sold by June 1. When a tax certificate has been sold, certified funds are required for payment.

The statement, "Prior year taxes are due. Please call (386) 736-5938.", indicates the parcel is delinquent.

The Volusia County Property Appraiser is responsible for the preparation of the current ad valorem tax roll, assessed value, exemptions, taxable value, assessed owner(s) name and mailing address, property address, and legal description. The Volusia County Property Appraiser's phone number is 386-736-5901 or email: vcpa@volusia.org.

The Volusia County Revenue Division is responsible for the preparation and mailing of tax notices based on information contained on the current tax roll certified by the Volusia County Property Appraiser and Non-Ad Valorem assessments provided by the levying authorities. The Volusia County Revenue Division phone number is 386-736-5938 or email: Revenue@volusia.org.

The Taxing Authorities are responsible for setting Ad Valorem Millage Rates.

The Levying Authorities are responsible for setting Non-Ad Valorem Assessments. (Phone number provided on front of bill.)

Partial payments of current year taxes are available. Partial payments are not eligible for discounts and incur a \$10 processing fee for each payment. For more information regarding partial payments, please call the Volusia County Revenue Division at 386-736-5938 or email: Revenue@volusia.org.

Important Dates to Remember:

March 1	Deadline to file for exemptions for next tax year with the Volusia County Property Appraiser.
March 31	Deadline for Working Waterfront, Affordable Rental Housing, or Homestead Tax Deferral Application for current tax roll.
March 31	Last day for full tax payment without penalty or to make a partial payment.
April 30	Deadline for new quarterly installment plan applications for the next tax year.

BillExpress™

Receive tax bills via email. (ebills)

Sign up for BillExpress™ online at volusia.county-taxes.com.
Multiple email accounts can be associated with one parcel.
Multiple parcels can be tied to one email.
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Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

Pay Online

volusia.county-taxes.com

Payment options available online:

E-check:

Use a checking account for a nominal fee.

Debit or Credit Card:

A convenience fee is charged by a third party provider.
The fee is a percentage of the total amount due.
American Express, Discover, MasterCard, and Visa



Volusia County Revenue Division
123 W Indiana Avenue Room 103
DeLand FL 32720

VOLUSIA COUNTY NOTICE OF AD VALOREM TAXES AND NON-AD VALOREM ASSESSMENTS REAL ESTATE REMINDER TAX BILL

9.1.m

PROPERTY ADDRESS: ELEANOR ST
HOLLY HILL 32117
LEGAL DESCRIPTION: LOT 3 EXC E 25 FT BLK 3 PINE CLU
STER FITCH GRANT HOLLY HILL
PER OR 4321 PG 2910

LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117



Pay Online

PARCEL: 424237030030
ALTERNATE KEY: 3197461
MILLAGE CODE: 203
TAX YEAR: 2018

paid

Pay online at volusia.county-taxes.com

WALK-IN CUSTOMERS PLEASE BRING ENTIRE NOTICE

IF RECEIVED BY:	Apr 30, 2019	May 31, 2019
PAY THIS AMOUNT:	50.10	73.10
FEES AND INTEREST:	Interest Added	Additional Fees

If a tax certificate is sold, certified funds are required for payment.

AD VALOREM TAXES

TAXING AUTHORITY	MILLAGE	ASSESSED VALUE	EXEMPTION	TAXABLE VALUE	TAX AMOUNT
COUNTY	6.24640	2,275		2,275	14.21
VOLUSIA FOREVER	0.09940	2,275		2,275	0.23
VOLUSIA ECHO	0.20000	2,275		2,275	0.46
VOLUSIA FOREVER I&S 2005	0.10060	2,275		2,275	0.23
VOLUSIA COUNTY MOSQUITO CONTRO	0.18800	2,275		2,275	0.43
PONCE INLET PORT AUTHORITY	0.09290	2,275		2,275	0.21
SCHOOL	6.28100	2,646		2,646	16.62
HOLLY HILL	6.50000	2,275		2,275	14.79
ST JOHNS WATER MANAGEMENT DIST	0.25620	2,275		2,275	0.58
FLORIDA INLAND NAVIGATION DIST	0.03200	2,275		2,275	0.07
HALIFAX HOSPITAL AUTHORITY	0.35460	2,275		2,275	0.81

TOTAL MILLAGE RATE: 20.35110

TOTAL TAXES: \$48.64

NON-AD VALOREM ASSESSMENTS

LEVYING AUTHORITY	TELEPHONE	RATE PER UNIT	AMOUNT
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TOTAL ASSESSMENTS: \$0.00

TOTAL COMBINED TAXES AND ASSESSMENTS: \$48.64

For additional information please see reverse side.

Pay online at volusia.county-taxes.com

Phone: 386-736-5938
Email: Revenue@volusia.org

RETURN WITH PAYMENT

Make payment to: COUNTY OF VOLUSIA
Mail payment to:
COUNTY OF VOLUSIA
VOLUSIA COUNTY REVENUE DIVISION
123 W Indiana Avenue Room 103
DeLand FL 32720

PAY IN U.S. DOLLARS DRAWN ON A U.S. BANK

LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

VOLUSIA COUNTY REAL ESTATE REMINDER TAX BILL

PROPERTY ADDRESS: ELEANOR ST
HOLLY HILL 32117

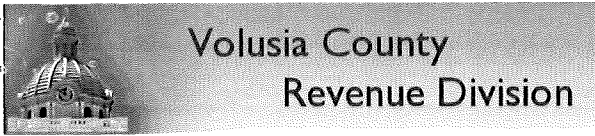
PARCEL: 424237030030
ALTERNATE KEY: 3197461
TAX YEAR: 2018

IF RECEIVED BY:	Apr 30, 2019	May 31, 2019
PAY THIS AMOUNT:	50.10	73.10
FEES AND INTEREST:	Interest Added	Additional Fees

If a tax certificate is sold, certified funds are required for payment.

Payment must be received in a Revenue Division office by 5 PM
on the date corresponding to the "PAY THIS AMOUNT" box.
Postmark is not allowed for delinquent payments.





Successfully checked out.

If the 2019 tax year first installment bill is not paid by July 31, 2019, the parcel will be removed from the installment plan.

The 2019-2020 business tax receipt renewal notice was mailed July 1.

Sign up for BillExpress (ebills). Click the "Get Bills by Email" button.

386-736-5938

Revenue@volusia.org

Receipt

[Print this page](#)

Thank you! Your payment is now being processed. You may wish to print this page for your records.

Receipt #

WWW-18-0033733

Date

07/10/2019 01:34PM

Paid by

Raymond Webb

Using

Credit or Debit Card ending in 1883

Real Estate			
2018 Annual bill	Account 424237030030	ELEANOR ST HOLLY HILL 32117	\$85.64
Convenience fee			+ \$2.23
Payment			- \$87.87
Total due			\$0.00

Attachment: Application (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning, LLC)

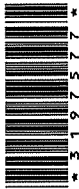
**Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720**

VOLUSIA COUNTY TAX BILL
NOTICE OF AD VALOREM TAXES AND NON-AD VALOREM ASSESSMENTS
 2018 Paid Individual Tax Certificate

9.1.m

PROPERTY ADDRESS: GARDEN AV, HOLLY HILL, 32117
LEGAL DESCRIPTION: N 1/2 OF LOT 23 & LOT 24 BLK 3 PINE CLUSTER FITCH GRANT HOLL
 Y HILL MB 7 PG 92 PER OR 5266
 See Additional Legal on Tax Roll

County of Volusia County of Volusia
Paid By Raymond Webb
07/11/2019 \$537
Receipt # WWW-18-0033780



LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

PARCEL:	424237030240
ALTERNATE KEY :	3197577
MILLAGE CODE:	203
TAX YEAR:	2018

CERTIFIED FUNDS ONLY

The taxes are delinquent. CERTIFIED FUNDS ONLY. A tax certificate may have been issued on this parcel. This could result in a tax deed sale for this parcel. Please contact the Volusia County Revenue Division.

WALK-IN CUSTOMERS PLEASE BRING ENTIRE NOTICE

TAXES BECOME DELINQUENT APRIL 1

Face: 505.85	Cert #7290	If Received By	Jul 31, 2019		
Rate: 0.25%	Bidder #4561647	Please Pay	\$0.00		

AD VALOREM TAXES

TAXING AUTHORITY	MILLAGE	ASSESSED VALUE	EXEMPTION	TAXABLE VALUE	TAX AMOUNT
COUNTY	6.24640	21,938	0	21,938	137.03
VOLUSIA FOREVER	0.09940	21,938	0	21,938	2.18
VOLUSIA ECHO	0.20000	21,938	0	21,938	4.39
VOLUSIA FOREVER I&S 2005	0.10060	21,938	0	21,938	2.21
VOLUSIA COUNTY MOSQUITO CONTROL	0.18800	21,938	0	21,938	4.12
PONCE INLET PORT AUTHORITY	0.09290	21,938	0	21,938	2.04
SCHOOL	6.28100	21,938	0	21,938	137.80
HOLLY HILL	6.50000	21,938	0	21,938	142.60
ST JOHNS WATER MANAGEMENT DIST	0.25620	21,938	0	21,938	5.62
FLORIDA INLAND NAVIGATION DIST	0.03200	21,938	0	21,938	0.70
HALIFAX HOSPITAL AUTHORITY	0.35460	21,938	0	21,938	7.78

TOTAL MILLAGE RATE:

20.35110

TOTAL TAXES:

\$446.47

NON-AD VALOREM ASSESSMENTS

LEVYING AUTHORITY	TELEPHONE	RATE PER UNIT	AMOUNT
TOTAL ASSESSMENTS:			\$0.00

TOTAL COMBINED TAXES AND ASSESSMENTS:

\$446.47

For additional information see reverse side.

Pay online at volusia.county-taxes.com

Phone: 386-736-5938
Revenue@volusia.org

RETURN WITH PAYMENT

Make payment to:
COUNTY OF VOLUSIA
VOLUSIA COUNTY REVENUE DIVISION
123 W Indiana Ave Room 103
DeLand FL 32720

PAY IN U.S. DOLLARS DRAWN ON A U.S. BANK
LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

VOLUSIA COUNTY TAX BILL
2018 Paid Individual Tax Certificate

CERTIFIED FUNDS ONLY

PARCEL:	424237030240
ALTERNATE KEY :	3197577
TAX YEAR:	2018

PROPERTY ADDRESS:
GARDEN AV, HOLLY HILL, 32117

TAXES BECOME DELINQUENT APRIL 1

Face: 505.85	Cert #7290	If Received By	Jul 31, 2019		
Rate: 0.25%	Bidder #4561647	Please Pay	\$0.00		

Public Site

Paid 07/11/2019

Receipt # WWW-18-0033780

\$537.39



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Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

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Unpaid taxes become delinquent April 1.

On April 1, delinquent real estate parcels are assessed a minimum charge of 3% per Florida Statute.

Notice: delinquent real estate parcels will incur an advertising fee, auction listing fee, and a tax certificate will be sold by June 1. When a tax certificate has been sold, certified funds are required for payment.

The statement, "Prior year taxes are due. Please call (386) 736-5938.", indicates the parcel is delinquent.

The Volusia County Property Appraiser is responsible for the preparation of the current ad valorem tax roll, assessed value, exemptions, taxable value, assessed owner(s) name and mailing address, property address, and legal description. The Volusia County Property Appraiser's phone number is 386-736-5901 or email: vcpa@volusia.org.

The Volusia County Revenue Division is responsible for the preparation and mailing of tax notices based on information contained on the current tax roll certified by the Volusia County Property Appraiser and Non-Ad Valorem assessments provided by the levying authorities. The Volusia County Revenue Division phone number is 386-736-5938 or email: Revenue@volusia.org.

The Taxing Authorities are responsible for setting Ad Valorem Millage Rates.

The Levying Authorities are responsible for setting Non-Ad Valorem Assessments. (Phone number provided on front of bill.)

Partial payments of current year taxes are available. Partial payments are not eligible for discounts and incur a \$10 processing fee for each payment. For more information regarding partial payments, please call the Volusia County Revenue Division at 386-736-5938 or email: Revenue@volusia.org.

Important Dates to Remember:

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March 31	Last day for full tax payment without penalty or to make a partial payment.
April 30	Deadline for new quarterly installment plan applications for the next tax year.

BillExpress™

Receive tax bills via email. (ebills)

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Multiple parcels can be tied to one email.
For assistance with multiple parcels, please call the Volusia County Revenue Division at 386-736-5938 or email: Revenue@volusia.org.



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Volusia County Revenue Division
123 W Indiana Ave Room 103
DeLand FL 32720

Pay Online

volusia.county-taxes.com

Payment options available online:

E-check:

Use a checking account for a nominal fee.

Debit or Credit Card:

A convenience fee is charged by a third party provider.
The fee is a percentage of the total amount due.
American Express, Discover, MasterCard, and Visa

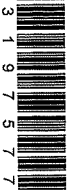


Volusia County Revenue Division
123 W Indiana Avenue Room 103
DeLand FL 32720

VOLUSIA COUNTY NOTICE OF AD VALOREM TAXES AND NON-AD VALOREM ASSESSMENTS REAL ESTATE REMINDER TAX BILL

9.1m

PROPERTY ADDRESS: GARDEN AV
HOLLY HILL 32117
LEGAL DESCRIPTION: N 1/2 OF LOT 23 & LOT 24 BLK 3 P
INE CLUSTER FITCH GRANT HOLL
Y HILL MB 7 PG 92 PER OR 5266 PG
3263 PER OR 6289 PG 3599 PE
R OR 6756 PG 3722



LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117



Pay Online

PARCEL: 424237030240
ALTERNATE KEY: 3197577
MILLAGE CODE: 203
TAX YEAR: 2018

total:
\$ 537.39

Pay online at volusia.county-taxes.com

WALK-IN CUSTOMERS PLEASE BRING ENTIRE NOTICE

IF RECEIVED BY:	Apr 30, 2019	May 31, 2019
PAY THIS AMOUNT:	459.86	482.86
FEES AND INTEREST:	Interest Added	Additional Fees

If a tax certificate is sold, certified funds are required for payment.

AD VALOREM TAXES

TAXING AUTHORITY	MILLAGE	ASSESSED VALUE	EXEMPTION	TAXABLE VALUE	TAX AMOUNT
COUNTY	6.24640	21,938		21,938	137.03
VOLUSIA FOREVER	0.09940	21,938		21,938	2.18
VOLUSIA ECHO	0.20000	21,938		21,938	4.39
VOLUSIA FOREVER I&S 2005	0.10060	21,938		21,938	2.21
VOLUSIA COUNTY MOSQUITO CONTRO	0.18800	21,938		21,938	4.12
PONCE INLET PORT AUTHORITY	0.09290	21,938		21,938	2.04
SCHOOL	6.28100	21,938		21,938	137.80
HOLLY HILL	6.50000	21,938		21,938	142.60
ST JOHNS WATER MANAGEMENT DIST	0.25620	21,938		21,938	5.62
FLORIDA INLAND NAVIGATION DIST	0.03200	21,938		21,938	0.70
HALIFAX HOSPITAL AUTHORITY	0.35460	21,938		21,938	7.78

TOTAL MILLAGE RATE: 20.35110

TOTAL TAXES: \$446.47

NON-AD VALOREM ASSESSMENTS

LEVYING AUTHORITY	TELEPHONE	RATE PER UNIT	AMOUNT
-------------------	-----------	---------------	--------

TOTAL ASSESSMENTS: \$0.00

TOTAL COMBINED TAXES AND ASSESSMENTS: \$446.47

For additional information please see reverse side.

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Phone: 386-736-5938
Email: Revenue@volusia.org

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COUNTY OF VOLUSIA
VOLUSIA COUNTY REVENUE DIVISION
123 W Indiana Avenue Room 103
DeLand FL 32720

PAY IN U.S. DOLLARS DRAWN ON A U.S. BANK

LED PARTNERS FLORIDA LLC
1539 GARDEN AVE
HOLLY HILL, FL 32117

VOLUSIA COUNTY REAL ESTATE REMINDER TAX BILL

PROPERTY ADDRESS: GARDEN AV
HOLLY HILL 32117

PARCEL: 424237030240
ALTERNATE KEY: 3197577
TAX YEAR: 2018

IF RECEIVED BY:	Apr 30, 2019	May 31, 2019
PAY THIS AMOUNT:	459.86	482.86
FEES AND INTEREST:	Interest Added	Additional Fees

If a tax certificate is sold, certified funds are required for payment.

Payment must be received in a Revenue Division office by 5 PM
on the date corresponding to the "PAY THIS AMOUNT" box.
Postmark is not allowed for delinquent payments.



Packet Pg. 1161

Attachment: Application (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning, LLC)

PLEASE RETAIN TOP PORTION FOR YOUR RECORDS

Altkey: 3197577
LED PARTNERS FLORIDA LLC

Parcel ID: 424237030240
GARDEN AVE , HOLLY HILL

Parcel

Short Parcel Id 424237030240
Property Location GARDEN AVE, HOLLY HILL, 32117
PC Code 1000 - VACANT COMM
Total Bldgs 0
Neighborhood 7252 - STATE STREET COMMERCIAL
Business Name
Homestead Property No

Primary Owner

Owner LED PARTNERS FLORIDA LLC

In Care Of
Mailing Address 1539 GARDEN AVE

HOLLY HILL FL 32117

All Owners

#	Owner 1	Owner 2	Owner %	Owner Type(s)
0	LED PARTNERS FLORIDA LLC		100	FS - Fee Simple

Legal

Millage Group 203-HOLLY HILL
Legal Description N 1/2 OF LOT 23 & LOT 24 BLK 3 PINE CLUSTER FITCH
GRANT HOLLY HILL MB 7 PG 92 PER OR 5266 PG 3263
PER OR 6289 PG 3599 PER OR 6756 PG 3722 PER OR
7642 PG 4638
Map TWP-RNG-SEC 14 - 32 - 42
Subdivision-Block-Lot 37 - 03 - 0240
Date Created 26-DEC-81
Year Annexed

Sales

Book/Page	Instr Type	Inst #	Sale Date	V/I	Sale Price
7642 / 4638	WD-WARRANTY DEED	2019004669	01/08/2019	V	\$100
6756 / 3722	QC-QUIT CLAIM DEED	2012162504	09/07/2012	V	\$100
6289 / 3599	WD-WARRANTY DEED	2008210555	10/20/2008	V	\$30,000
5266 / 3263	WD-WARRANTY DEED	2004045572	02/24/2004	V	\$15,000
2026 / 1748	WD-WARRANTY DEED		11/15/1978	V	\$3,000
1080 / 0044	WD-WARRANTY DEED		02/15/1969	V	\$3,000

Community Redevelopment Areas

Project #	Description	Year Beg	Year End
-----------	-------------	----------	----------

Attachment: Application (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning, LLC)



Home	Search	Downloads	Exemptions	Agriculture	Maps	Tangible	Links	Contact
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Summary

Land & Agriculture

Bldg(s) - Residential

Bldg(s) - Commercial

Misc Improvements

Bldg(s) - Sketch

Values

Permits

Map

Pictometry

Altkey: 3197461
LED PARTNERS FLORIDA LLC

Parcel ID: 424237030030
ELEANOR ST, HOLLY HILL

Return to Search Results

- Actions
- Neighborhood Sales
 - Printable Summary
 - Printable Version

- Reports
- Export to Excel - Real Pr
 - Mailing List

Go

Links

Search Help

All Owners

#	Owner 1	Owner 2	Owner %	Owner Type(s)
0	LED PARTNERS FLORIDA LLC		100	FS - Fee Simple

Legal

Millage Group	203-HOLLY HILL
Legal Description	LOT 3 EXC E 25 FT BLK 3 PINE CLUSTER FITCH GRANT HOLLY HILL PER OR 4321 PG 2910 PER OR 7642 PG 4638
Map TWP-RNG-SEC	14 - 32 - 42
Subdivision-Block-Lot	37 - 03 - 0030
Date Created	26-DEC-81
Year Annexed	

Sales

Attachment: Application (2020-O-3026 : Rezone - 1541 Garden Avenue - Kenco Sign & Awning, LLC)

Book/Page	Instr Type	Inst #	Sale Date	V/I	Sale Price
7642 / 4638	WD-WARRANTY DEED	2019004669	01/08/2019	V	\$100
6756 / 3721	QC-QUIT CLAIM DEED	2012162503	09/07/2012	V	\$100
4321 / 2910	WD-WARRANTY DEED	1998119244	06/15/1998	V	\$2,500
4021 / 2434	WD-WARRANTY DEED	1995102700	07/15/1995	V	\$2,000
1342 / 0430	WD-WARRANTY DEED		10/15/1971	V	\$4,800

Community Redevelopment Areas

Project #	Description	Year Beg	Year End
92	HOLLY HILL CRA	2001	9999

County Links

Property Tax Bill
Link to Permits

CLICK HERE
CLICK HERE

Other Links

Google Street Address
Bing Maps

CLICK HERE
CLICK HERE

Data Copyright Volusia County Florida

Last Updated: 24/Jun/2019

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LEGAL DESCRIPTION

Short Parcel ID	424237030030
Property Location	ELEANOR ST, HOLLY HILL, 32117
PC Code	0000 - VACANT RES
Total Bldgs	0
Neighborhood	2707 - WITTBOLD REPLAT (4242-32)
Business Name	
Homestead Property	No

Legal Description	LOT 3 EXC E 25 FT BLK 3 PINE CLUSTER FITCH GRANT HOLLY HILL PER OR 4321 PG 2910 PER OR 7642 PG 4638
--------------------------	--



Home	Search	Downloads	Exemptions	Agriculture	Maps	Tangible	Links	Contact
------	--------	-----------	------------	-------------	------	----------	-------	---------

Summary

Land & Agriculture

Bldg(s) - Residential

Bldg(s) - Commercial

Misc Improvements

Bldg(s) - Sketch

Values

Permits

Map

Pictometry

Altkey: 3197577
LED PARTNERS FLORIDA LLC

Parcel ID: 424237030240
GARDEN AVE , HOLLY HILL

1 of 1
Return to Search Results

Parcel	424237030240
Short Parcel Id	GARDEN AVE, HOLLY HILL, 32117
Property Location	1000 - VACANT COMM
PC Code	0
Total Bldgs	7252 - STATE STREET COMMERCIAL
Neighborhood	No
Business Name	
Homestead Property	

Actions
Neighborhood Sales
Printable Summary
Printable Version

Reports

Export to Excel - Real Pr
Mailing List

Go

Links

Search Help

All Owners

#	Owner 1	Owner 2	Owner %	Owner Type(s)
0	LED PARTNERS FLORIDA LLC		100	FS - Fee Simple

Legal

Millage Group	203-HOLLY HILL
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1080 / 0044	WD-WARRANTY DEED		02/15/1969	V	\$3,000

Community Redevelopment Areas

Project #	Description	Year Beg	Year End
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County Links

Property Tax Bill
Link to Permits

CLICK HERE
CLICK HERE

Other Links

Google Street Address
Bing Maps

CLICK HERE
CLICK HERE

Data Copyright Volusia County Florida

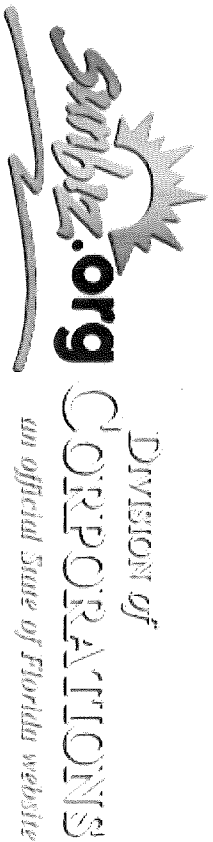
Last Updated: 24/Jun/2019

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LEGAL DESCRIPTION

Short Parcel Id	424237030240
Property Location	GARDEN AVE, HOLLY HILL, 32117
PC Code	1000 - VACANT COMM
Total Bldgs	0
Neighborhood	7252 - STATE STREET COMMERCIAL

Legal Description	N 1/2 OF LOT 23 & LOT 24 BLK 3 PINE CLUSTER FITCH GRANT HOLLY HILL MB 7 PG 92 PER OR 5266 PG 3263 PER OR 6289 PG 3599 PER OR 6756 PG 3722 PER OR 7642 PG 4638
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Department of State / Division of Corporations / Search Records / Detail By Document Number /

Detail by Entity Name

Florida Limited Liability Company
LED PARTNERS FLORIDA L.L.C.

Filing Information

Document Number L16000043207

FEI/EIN Number 81-1873169

Date Filed 03/01/2016

Effective Date 03/01/2016

State FL

Status ACTIVE

Principal Address

1539 GARDEN AVE

HOLLY HILL, FL 32117

Mailing Address

1539 GARDEN AVE

HOLLY HILL, FL 32117

Document Address

REGISTRATION SYSTEM INQUIRY & ANALYSIS

WEBB, RAYMOND
1539 GARDEN AVE
HOLLY HILL, FL 32117

Authorized Person(s) Detail

Name & Address

Title MGR

WEBB, RAYMOND
1539 GARDEN AVE
HOLLY HILL, FL 32117

Annual Reports

Report Year	Filed Date
2017	03/17/2017
2018	04/17/2018
2019	04/30/2019

Document Images

<u>04/30/2019 -- ANNUAL REPORT</u>	View image in PDF format
<u>04/17/2018 -- ANNUAL REPORT</u>	View image in PDF format
<u>03/17/2017 -- ANNUAL REPORT</u>	View image in PDF format
<u>03/01/2016 -- Florida Limited Liability</u>	View image in PDF format



**STAFF REPORT
CITY OF HOLLY HILL, FLORIDA**

**City Commission
Agenda Item**

MEETING DATE: May 12, 2020
FROM: Brian Walker
SUBJECT: 1730 Birmingham Avenue - Request for a Side Yard (North) Setback Variance from Eight (8) Feet to Zero (0) Feet, and a Rear Yard Setback Variance from Twenty (20) Feet to Eight (8) Feet, in Order to Build a Two Car Garage, an Attached Carport Structure, and a Covered Porch.
NUMBER: (ID # 2909)
APPLICANT: Michael Wise
PLANNER: Brian Walker

INTRODUCTION

This item went to BOPA as a request for a front, side, and rear setback variance. The applicant has since withdrawn the request for a front yard setback variance.

1730 Birmingham Avenue - Request for a side yard (north) setback variance from eight (8) feet to zero (0) feet, and a rear yard setback variance from twenty (20) feet to eight (8) feet, in order to build a two car garage, an attached carport structure, and a covered porch. The property is zoned R-2 (Low Medium Density Single-Family Residential District) and located on the northwest end of Birmingham Avenue and more particularly known as 1730 Birmingham Avenue; V-2020-01 (Michael Wise, Applicant) (Brian Walker, City Planner)

BACKGROUND

- The property is approximately .2870 acres or 12,501 square feet in size and zoned R-2 (Low Medium Density Single-Family Residential District), with a Low Density Single-Family Residential future land use designation.
- Property Appraiser records indicate a single-family home was built on the property in 1980 and currently contains a 2,765 square foot house.
- The property abuts an actively used golf course.
- A small portion of the property on the north and west, is in a SFHA with an AE designation.
- The applicant purchased the property in late 2017.

DISCUSSION

The property abuts an 18 hole golf course known as the Riviera Country Club. The home has no

protective separation from the golf course, and because of its location relative to the golf course, the home and automobiles have been hit several times by golf balls. The home and cars have suffered broken windows and damage to the paint and exterior surfaces. Golf balls land in the side and backyard which interferes with the applicant's enjoyment of the yard.

In order to ameliorate this situation, the applicant is proposing to build an attached carport on the north side of their home, and a two car garage and covered porch to the west, in back of the home.

VARIANCE: The request is for two variances from the Land Development Regulations of Holly Hill, Sec. 114-765, in order to build a two car garage, an attached carport structure, and a covered porch that will offer protection from golf balls. The requested variances are as follows: (1) a side yard (north) setback variance from eight (8) feet to zero (0) feet, (2) a rear yard setback variance from twenty (20) feet to eight (8) feet.

All variances shall apply to the proposed structures only.

In order to grant the variance request, the commission must find that the request meets the requirements of Sec. 82-317.

VARIANCE CRITERIA - Sec. 82-317

CRITERIA No. 1:

That special conditions and circumstances exist which are peculiar to the land, structure or building involved, as distinguished from the applicant himself, and which are not applicable to other lands, structures or buildings in the same zoning district.

FINDINGS OF FACT No. 1:

The subject property has a special condition that would support the requested variances. The property abuts a golf course and regularly suffers damage from golf balls.

Criteria met? Yes

CRITERIA No. 2:

That the special conditions and circumstances do not result from the actions of the applicant.

FINDINGS OF FACT No. 2:

The need for the requested variances are not the result of any action by the applicant. The house was built adjacent to a golf course without any protection from golf balls.

Criteria met? Yes

CRITERIA No. 3:

That granting the variance requested will not confer on the applicant any special privilege that is denied by this subpart to other lands, buildings or structures in the same zoning district.

FINDINGS OF FACT No. 3:

Granting the variances requested would not confer on the applicant a special privilege that is denied by the provisions of this section to other lands or structures under similar conditions. Properties under similar circumstances can also apply for a variance.

Criteria met? Yes

CRITERIA No. 4:

That a literal interpretation of the provisions of this subpart would deprive the applicant of rights commonly enjoyed by other properties in the same zoning district under the terms of this subpart, and would work an unnecessary and undue hardship on the applicant.

FINDINGS OF FACT No. 4:

The literal interpretation of the provisions would deprive the applicant the right to expand upon their home in a way that will provide protection from hit golf balls and enjoy their yard.

Criteria met: Yes

CRITERIA No. 5:

That the variance granted is the minimum variance necessary to make possible the reasonable use of the land, building or structure.

FINDINGS OF FACT No. 5:

The requested variances are the minimum necessary to make reasonable use of the building and land.

Criteria met? Yes

CRITERIA No. 6:

That the grant of the variance will be in harmony with the general intent and purpose of this subpart and the city's comprehensive plan, and that such variance will not be injurious to the area involved or otherwise detrimental to the public welfare.

FINDINGS OF FACT No. 6:

Granting the variances will be in harmony with Policy 1.1.2 and the general intent and purpose of the comprehensive plan.

Criteria met? Yes

FINDINGS OF FACT:

Staff finds that the applicant has met all of the criteria as stated above to grant the three requested variances.

ADDITIONAL INFORMATION:

Sec. 82-320. - Expiration.

A variance shall begin to serve the purpose for which it was granted within 18 months following the granting action by the city commission and shall otherwise become void. However, a shorter period of time may be stipulated by the city commission in an individual case as a condition imposed pursuant to Section 82-316.

BOARD OF PLANNING AND APPEALS RECOMMENDATION:

At its meeting on Monday, May 4th, the Board of Planning and Appeals recommended as follows:

APPROVAL of the variance request for the rear-yard setback

APPROVAL of the variance request for the side-yard setback

DENIAL of the variance request for the front-yard setback **(Front-yard setback variance request has since been withdrawn)**

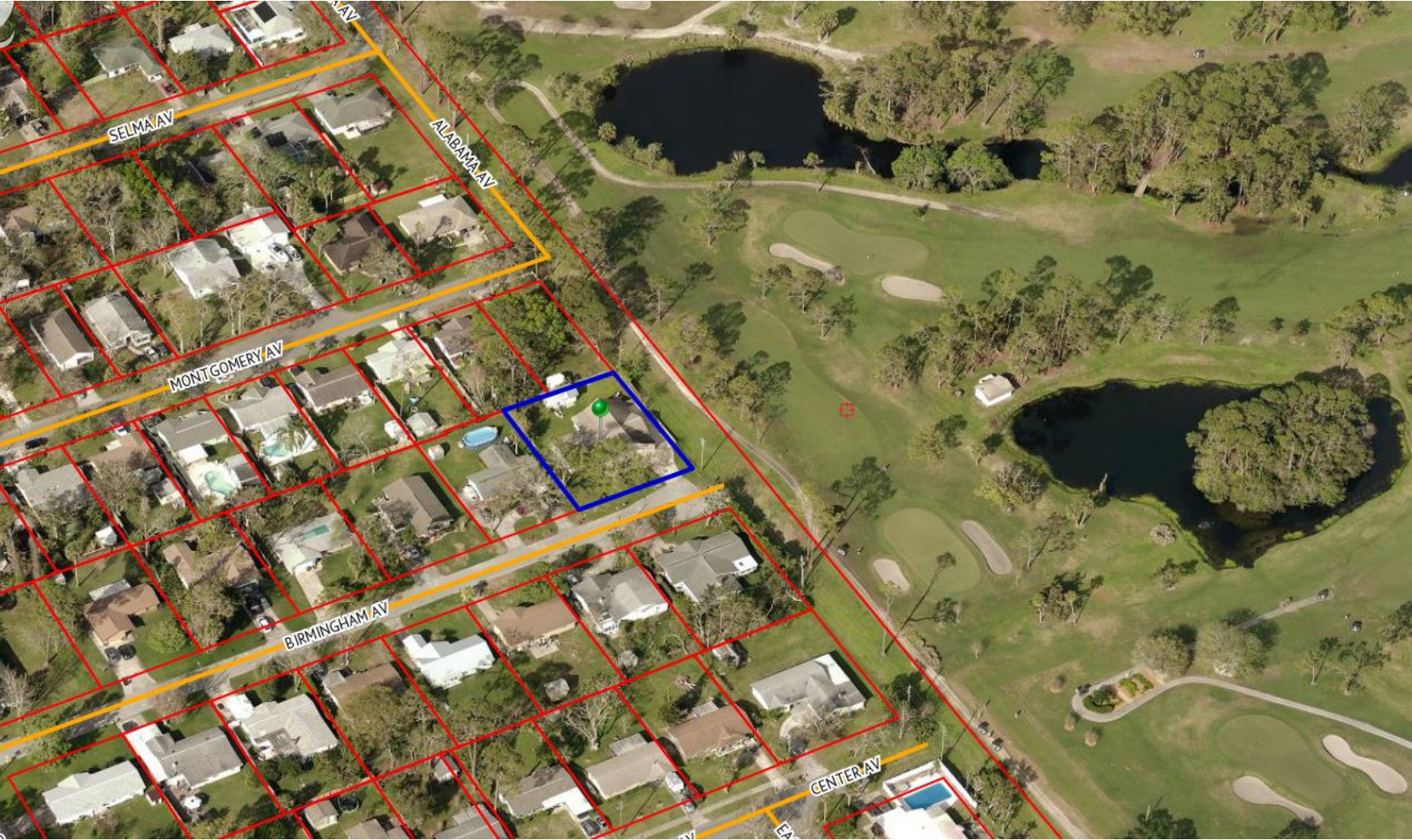
STAFF RECOMMENDATION:

Staff recommends approval of the request for two variances from the Land Development Regulations of Holly Hill, Sec. 114-765 as follows: (1) a side yard (north) setback variance from eight (8) feet to zero (0) feet, (2) a rear yard setback variance from twenty (20) feet to eight (8) feet.

- Site Map (PDF)
- View of House Looking West (PDF)
- Aerial Looking at the North and West Side of the House (PDF)
- Proposed Site Plan (PDF)
- Survey1 (PDF)

- Survey2 (PDF)
- Flood Map (PDF)
- Pictures of Damage, Etc (PDF)
- Elevations (PDF)
- Letter From Rear Neighbor (PDF)
- Application (PDF)
- Withdrawl of Front Variance Request (PDF)

Site Map



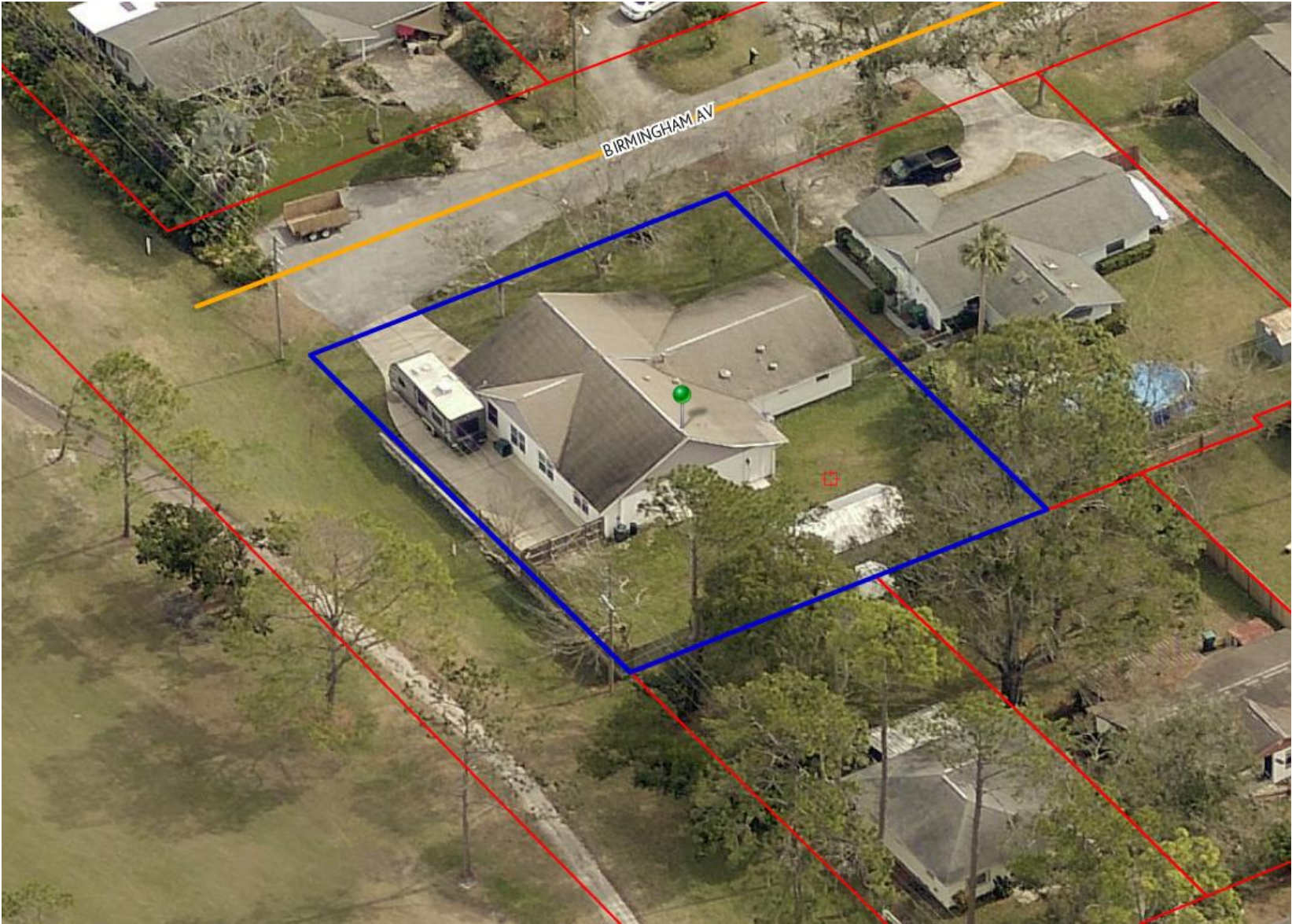
Attachment: Site Map (2909 : Variance Request - 1730 Birmingham Avenue)

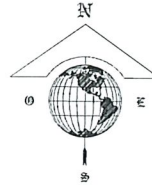
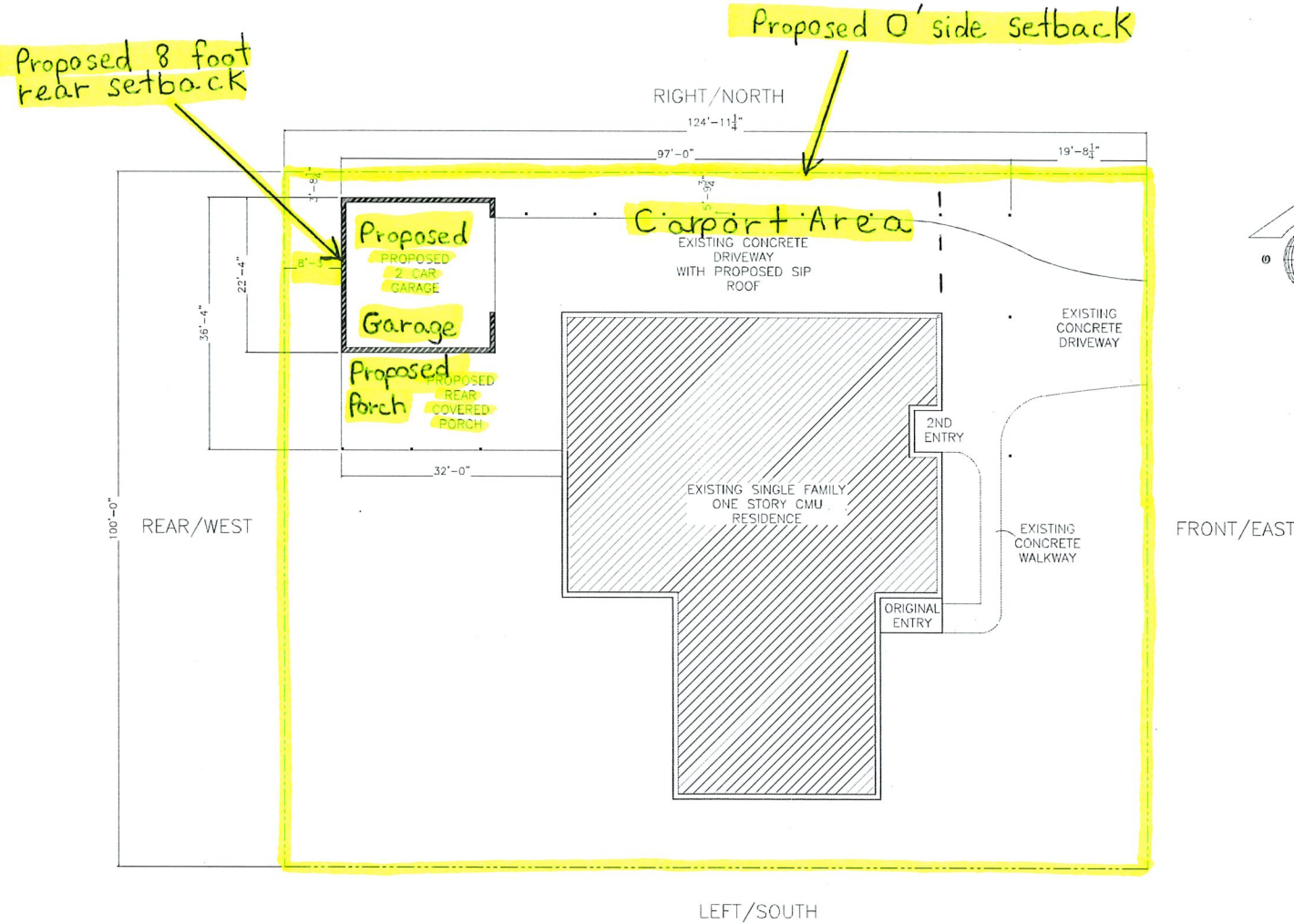
View of House Looking West



Attachment: View of House Looking West (2909 : Variance Request - 1730 Birmingham Avenue)

Aerial Looking at the North and West Side of the House





STANLEY P. HOELLE
ARCHITECT
11141 STILETTO DR
DAYTONA BEACH, FLORIDA 32127
386-258-8700 EXT. 4302

CONTRACTOR NOTICE
THE USER OF THESE DRAWINGS AND SPECIFICATIONS SHALL BE
RESTRICTED TO THE EXACT USE
FOR WHICH THEY WERE PREPARED
AND NO PART OF THIS DOCUMENT IS
EXPLICITLY LIMITED TO SUCH USE.
IF THE USER OF THESE DRAWINGS
AND SPECIFICATIONS REPRODUCES
THESE DRAWINGS AND SPECIFICATIONS
IN ANY MANNER, THE USER SHALL
BE RESPONSIBLE FOR OBTAINING
THE NECESSARY PERMISSIONS FROM
THE DESIGNER. NO PART OF THIS
DOCUMENT SHALL BE REPRODUCED
OR TRANSMITTED IN ANY FORM OR
BY ANY MEANS, ELECTRONIC OR
MECHANICAL, INCLUDING PHOTOCOPYING,
RECORDING, OR BY ANY INFORMATION
SYSTEM, WITHOUT PERMISSION IN
WRITING FROM THE DESIGNER.

ALL CONTRACTORS AND
SUB-CONTRACTORS
SHALL BE RESPONSIBLE FOR
OBTAINING THE NECESSARY
PERMISSIONS FROM THE
DESIGNER PRIOR TO CONSTRUCTION.

RESIDENTIAL
GOLF BALL PROTECTION

OWNER:
RODGERS BURL L.

PLAN DATE:
January 15,
2020

"PLANS CONFORM TO"
2017 FLORIDA BUILDING CODE
2014 NATIONAL ELEC CODE
2015 NFPA DESIGN CRITERIA
2014 ASCE 24 DESIGN CRITERIA
STRUCTURALLY ADEQUATE FOR
ALTERATION LEVEL 2
RISK CATEGORY: 2
WIND VELOCITY (MPH): 140
EXPOSURE CATEGORY: D
INTERNAL PRESSURE: -18

STANLEY P. HOELLE
ARCH #0033

LOCATION:
1730
BIRMINGHAM AVE.
HOLLY HILL,
32117

PAGE:
4 of 6

PROPOSED SITE PLAN

Attachment: Proposed Site Plan (2909 : Variance Request - 1730 Birmingham Avenue)

JOB # 2018-087

SHEET 3 OF 3: NOT VALID WITHOUT SHEETS 1 & 2.

COPYRIGHT: AWAD LAND SURVEYING, INC., 12/31/18

NOTES:

- 1) BEARINGS BASED ON PLAT WITH THE SLY R/W LINE OF KANSAS AVENUE, BEING, **S.65DEG.00'44"W.**
- 2) MAP OF BOUNDARY SURVEY BASED ON EXISTING MONUMENTATION OF **FLOMICH GARDEN SECTION HOLLY HILL HEIGHTS .**
- 3) DESCRIPTION FURNISHED BY CLIENT OR THEIR REPRESENTATIVES.
- 4) MAP OF BOUNDARY SURVEY AND REPORT FOR **BURL L. RODGERS** FOR BUILDING PERMIT.
- 5) LANDS SHOWN HEREON HAVE NOT BEEN ABSTRACTED BY AWAD LAND SURVEYING, INC., FOR RIGHT-OF-WAYS, EASEMENTS, AND/OR OTHER INSTRUMENTS OF RECORD. THERE MAY BE ADDITIONAL RESTRICTIONS AND/OR OTHER MATTERS OF RECORDS THAT MAY BE FOUND IN THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.
- 6) REPRODUCTIONS OF THIS SKETCH ARE NOT VALID UNLESS SIGNED AND SEALED WITH AN EMBOSSED SURVEYOR'S SEAL.
- 7) UNDERGROUND AND OVERHEAD IMPROVEMENTS SUCH AS SPRINKLERS, CONC. CURBING, UNDERGROUND TANKS, ROOF OVERHANGS, CABLE LINES, WATER LINES, GAS LINES, SEWER LINES, ETC. IF ANY, WERE NOT LOCATED.
- 8) LANDS SHOWN HEREON ARE CONSIDERED TO BE IN **ZONE X (LIGHT AND DARK SHADED), ZONE A, AND ZONE AE**, AS ESTABLISHED BY THE NATIONAL FLOOD INSURANCE PROGRAM, **COMMUNITY PANEL #12127C0218K**, EFFECTIVE DATE 9/29/17.
- 9) ADDITIONS OR DELETIONS TO THE SURVEY MAP OR REPORT BY OTHER THAN THE SIGNING PARTY OF PARTIES IS PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.
- 10) WETLANDS, IF ANY, WERE NOT LOCATED.
- 11) OBJECTS CLOSE TO THE PROPERTY LINE, SUCH AS FENCES, UTILITIES, ETC. MAY BE EXAGGERATED TO SHOW THERE RELATIONSHIP WITH THE PROPERTY LINE AND ARE NOT TO SCALE.
- 12) DIMENSIONS SHOWN HEREON ARE IN U.S. FEET AND DECIMALS THEREOF.
- 13) ERROR IN CLOSURE = 1' = 73,936.67'

LEGEND:

- = FOUND 1 1/2" IRON PIPE (NO ID)
- = SET 1" IRON PIPE & CAP (L.B.# 7492)
- ⊙ = FOUND 1" IRON PIPE & CAP (L.S.# 4002)
- N = NORTH, E = EAST, S = SOUTH, W = WEST (OR ANY COMBINATION)
 - ° = DEGREES WHEN USED IN A BEARING AND/OR ANGLE
 - ' = MINUTES WHEN USED IN A BEARING AND/OR ANGLE
 - " = SECONDS WHEN USED IN A BEARING AND/OR ANGLE
- R/W = RIGHT OF WAY
- C/L = CENTERLINE
- CONC. = CONCRETE
- AC = AIR CONDITIONER
- L.S. = LICENSED SURVEYOR
- ID = IDENTIFICATION
- CP = CONCRETE PAD
- L.B. = LICENSED BUSINESS
- MEAS. = MEASURED
- P.S.M. = PROFESSIONAL SURVEYOR & MAPPER

THIS MAP OF BOUNDARY SURVEY AND REPORT IS CERTIFIED TO AND PREPARED FOR THE SOLE AND EXCLUSIVE BENEFIT OF THE ENTITIES AND/OR INDIVIDUALS LISTED BELOW, ON THE MOST CURRENT DATE, AND SHALL NOT BE RELIED UPON BY ANY OTHER ENTITY OR INDIVIDUAL WHOMSOEVER.
BURL L. RODGERS.

SURVEY REPORT
 PREPARED BY:
AWAD LAND SURVEY, INC.;
L.B. # 7492

PLACE OF PRACTICE
 526 ANDALUSIA AVENUE
 ORMOND BEACH, FL., 32174
 386-677-5550 (PHONE)
 386-677-5744 (FAX)

AWADLANDSURVEYING@ATT.NET (EMAIL)

MAILING ADDRESS: 115 PINE TREE DRIVE, ORMOND BEACH, FLORIDA, 32174

LEGAL DESCRIPTION:

THE NORTHERLY 100 FEET OF LOT 1 AND 2 AND THE NORTHERLY 100 FEET OF THE EASTERLY 25 FEET OF LOT 3, BLOCK 6, FLOMICH GARDEN SECTION HOLLY HILL HEIGHTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN PLAT BOOK 10, PAGE 93, OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

SHEET 1 OF 3
NOT VALID WITHOUT SHEETS 2 AND 3

I HEREBY CERTIFY THAT THIS SURVEY OF THE PROPERTY DESCRIBED HEREON, AS RECENTLY SURVEYED AND DRAWN UNDER MY SUPERVISION, COMPLIES WITH THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 5J-17.050 THROUGH 5J-17.052, FLORIDA ADMINISTRATIVE CODE PURSUANT TO 472.027, FLORIDA STATUTES.

Michael E. Awad 12/31/18

MICHAEL E. AWAD DATE SIGNED
 PROFESSIONAL SURVEY AND MAPPER # 5574

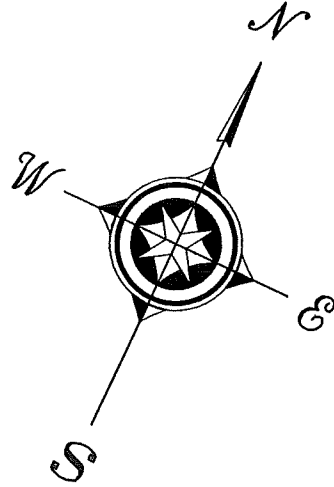
FIELD DATE: 12/01-31/2018
 JOB NO: 2018-087
 FIELD BOOK: 93 PAGES 65 & 66
 FIELD CREW: MEA
 DRAWN BY: MEA

WESTERLY R/W LINE OF MONTGOMERY AVENUE (50' R/W)

GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.



250' PLAT
250.77' MEAS.

50' PLAT

LOT 5
BLOCK 6

50' PLAT

150' PLAT

KANSAS AVENUE (60' R/W) NOT OPENED

UTILITY
POLE
(TYPICAL)

50' PLAT

100' DEED

N 25°10'22" W
100.00' MEAS.

OVERHEAD
UTILITIES

0.3' NLY
0.6' ELY

24.3' FRAME
SHED

6' WOODEN
FENCE

25' DEED

NLY 100'
OF THE
ELY 25'
OF LOT 3

REMAINING
PORTION OF
LOT 2

50' PLAT

S 65°00'44" W
500.05' MEAS.

124.96' MEAS.

125' DEED

124.94' MEAS.

125' DEED

S 65°05'09" W

N 65°04'07" E

50' PLAT

REMAINING
PORTION OF
LOT 1

NLY 100'
OF LOT 1

CONC.
DRIVE

CONC.
DRIVE

50' PLAT

50' DEED
500.05' MEAS.
500' DEED

N 25°02'19" W

S 25°11'09" E

CABLE
BOX

WATER
METERS

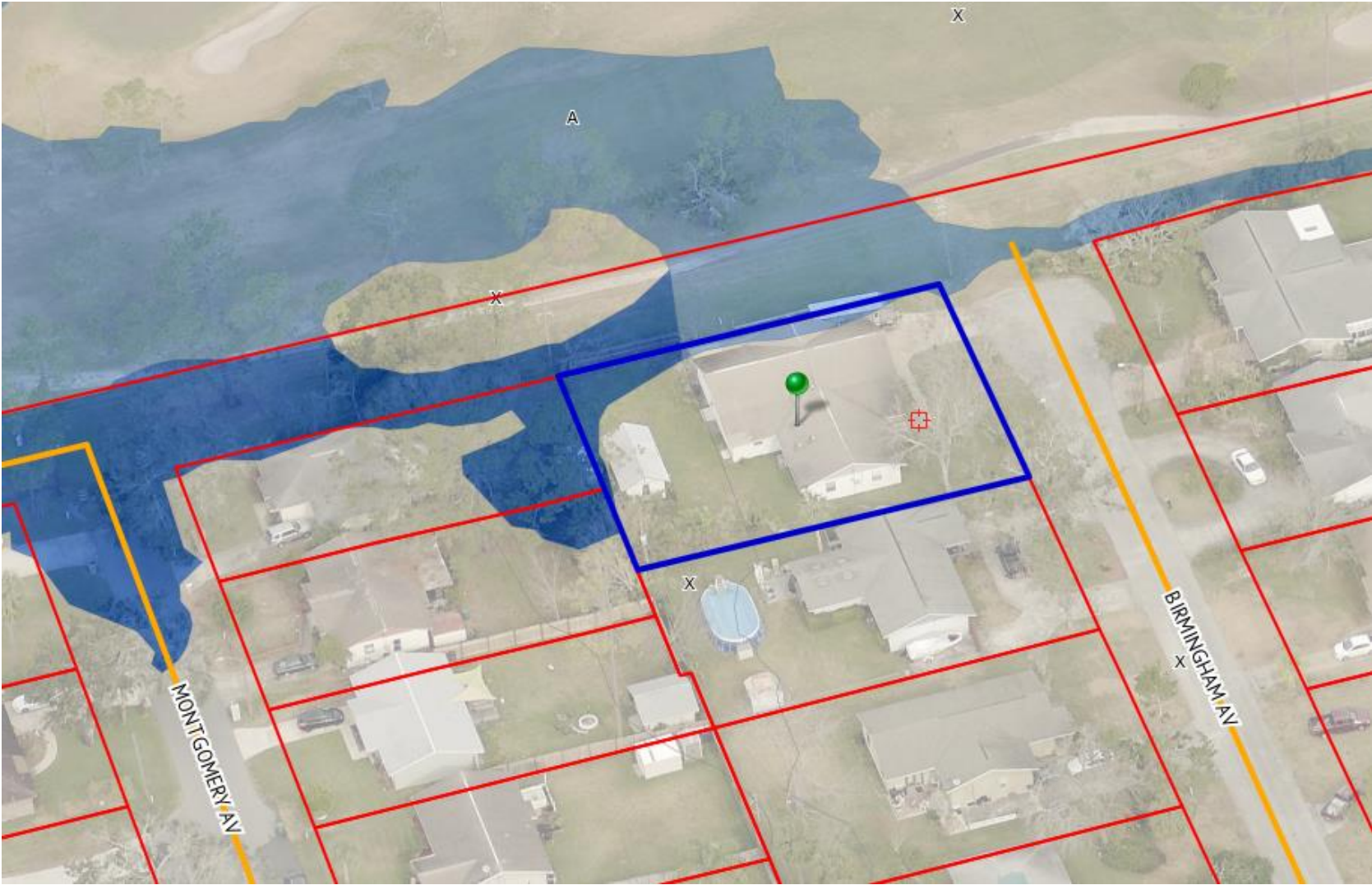
100' DEED

50' PLAT
50.00' MEAS.

ASPHALT PAVEMENT
BIRMINGHAM STREET (PLAT)

BIRMINGHAM AVENUE (50' R/W)

Flood Map



Attachment: Flood Map (2909 : Variance Request - 1730 Birmingham Avenue)



Golfball
hit



Gas Grill

↑
Golf Ball
Hit



AEP
GENUINE AUTOGLASS PART
AST M163 DOT 417
LAMINATED CLEAR
122V 0234 10 05113

First Hit →

← Popped up
& landed



Golf Ball Hit

Attachment: Pictures of Damage, Etc (2909 : Variance Request - 1730 Birmingham Avenue)



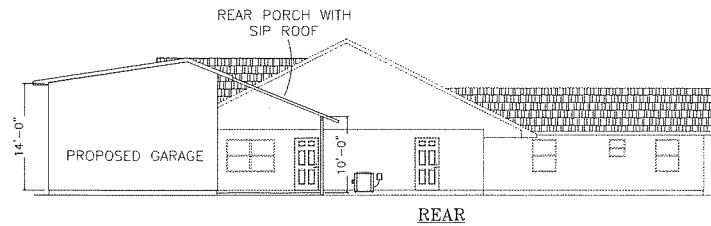
FCW
LAWRENCE
COURTESY
2007/04

Golf Ball Hit

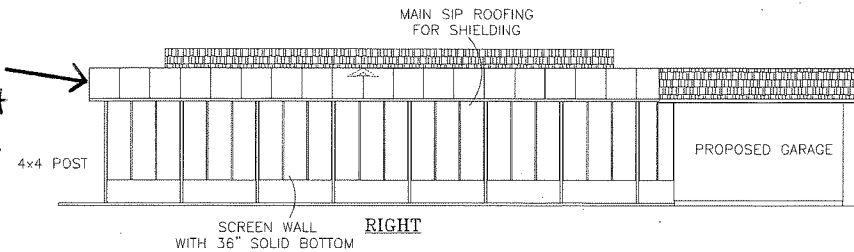
Attachment: Pictures of Damage, Etc (2909 : Variance Request - 1730 Birmingham Avenue)



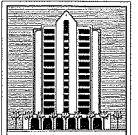




Proposed Carport not to extend past front of house



PROPOSED ELEVATIONS PLAN



STANLEY P. HOELLE
ARCHITECT
1114 HASTLEY DR.
DAYTONA BEACH, FLORIDA 32127
386.255.0010, 386.255.0011

COPYRIGHT NOTICE
THE USE OF THESE DRAWINGS AND SPECIFICATIONS SHALL BE RESTRICTED TO THE PROJECT, SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REUSE, REPRODUCTION, OR PUBLICATION BY ANY METHOD, IN WHOLE OR IN PART, IS PROHIBITED. TITLE TO THE DRAWINGS AND SPECIFICATIONS REMAINS IN THE DESIGNER WITHOUT PREJUDICE. USUAL, COMMON, AND KNOWN DRAWINGS AND SPECIFICATIONS SHALL CONSTITUTE FINAL EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS.

(ALL CONTRACTORS & SUB-CONTRACTORS)
ALL CHANGES ARE TO BE NOTED BY THE ARCHITECT, ENGINEER, A/OP DESIGNER
ALL DRAWINGS
"MUST BE MADE KNOWN" TO THE DESIGN PROFESSIONAL OF RECORD (PRIOR TO CONSTRUCTION)

SEAL BOX

RESIDENTIAL
GOLF BALL PROTECTION

OWNER:
RODGERS BURL L.

PLAN DATE:
January 15,
2020

"PLANS CONFORM TO"
2019 FLORIDA BUILDING CODE
2014 NATIONAL ELEC CODE
2016 IFBC DESIGN CRITERIA
2014 ASCEA DESIGN CRITERIA
STRUCTURALLY ADEQUATE FOR
ALTERATION LEVEL: 2
RISK CATEGORY: 2
WIND VELOCITY (MPH): 140
EXPOSURE CATEGORY: D
INTERNAL PRESSURE: .18

STANLEY P. HOELLE
ARCH #0033

LOCATION:
1730
BIRMINGHAM AVE,
HOLLY HILL,
32117

PAGE:
5 OF 6

Attachment: Elevations (2009 : Variance Request - 1730 Birmingham Avenue)

To Whom It May Concern,

I received this variance notice April 26th regarding 1730 Birmingham Avenue property which doesn't give me much time to reply. Since I don't have a computer and don't want to appear because of the virus.

I have never met these folks and have never had any contact with them; I am sure they are good people.

I have lived here for over 30 some years and over those years have had 3 golf balls hit my property and my house is closer to the tee off than theirs.

The rear yard variance they request is 8 feet which puts it close to my property.

I understand they want to build a garage and a patio. The garage I guess would be on the left hand side and the patio would be in the middle between the two buildings = right hand building which already exists

Garage / Patio Existing
Bell

2

That would put the patio right
across from my back bedroom
(which I use)

I am concerned about parties,
lights and loud music or noises
if they are that close.

In respect to their wishes,
I would prefer for this not to happen.

I hope this doesn't make any
hard feelings I don't mean to do that.
but since I am older I am concerned.

Respectfully
Shirley Bartley

V# _____



HOLLY HILL

FLORIDA

1065 Ridgewood Avenue, Holly Hill, FL 32117

TELEPHONE: (386) 248-9442 PERMITDESK@HOLLYHILLFL.ORG

VARIANCE

COMPLETE APPLICATION PACKET MUST BE SUBMITTED BY APPLICATION DUE DATE IN ORDER TO MEET THE DEADLINE FOR THE DESIRED MEETING

PROPERTY

PARCEL ID #: <u>424222060010</u>	
ADDRESS: <u>1730 Birmingham Ave. Holly Hill FL 32117</u>	
TOTAL ACREAGE: RESIDENTIAL <u>.2870</u>	USE OF PROPERTY: ☒ RESIDENTIAL ☐ NON-
ZONING: <u>R-2</u>	FUTURE LAND USE: <u>Low Density SF Residential</u>
TYPE OF STRUCTURE: ☐ SHED ☐ FENCE ☐ POOL ☐ SCREEN ENCLOSURE ☐ ADDITION ☒ SINGLE FAMILY HOME	
DESCRIPTION OF STRUCTURE:	
TYPE OF VARIANCE:	☒ FRONT YARD SETBACK REQUIRED: <u>30'</u> FT. PROPOSED: <u>20'</u> FT.
	<u>North side -</u> ☒ SIDE YARD SETBACK REQUIRED: <u>8'</u> FT. PROPOSED: <u>0</u> FT.
	☐ SIDE STREET SETBACK REQUIRED: _____ FT. PROPOSED: _____ FT.
	☒ REAR YARD SETBACK REQUIRED: <u>20'</u> FT. PROPOSED: <u>8'</u> FT.
	☐ MINIMUM LOT SIZE REQUIRED: _____ SQ. FT. ACTUAL: _____ SQ. FT.
	☐ WIDTH AT BUILDING LINE REQUIRED: _____ FT. ACTUAL: _____ FT.
	☐ HEIGHT REQUIRED: _____ FT. PROPOSED: _____ FT.
IS THIS REQUEST FOR A STRUCTURE THAT HAS ALREADY BEEN BUILT? ☐ YES ☒ NO	
IS THE PROPERTY AVAILABLE FOR INSPECTION WITHOUT APPOINTMENT? ☒ YES ☐ NO	

OWNER

NAME: <u>Burl Rodgers</u>	COMPANY:	
ADDRESS: <u>1730 Birmingham Ave</u>		
CITY: <u>Holly Hill</u>	STATE: <u>FL.</u>	ZIP: <u>32117</u>
PHONE: <u>(330) 668-6261</u>	EMAIL: <u>Rodgersgrinding@gmail.com</u>	

Revised 2018

Attachment: Application (2909 : Variance Request - 1730 Birmingham Avenue)

V# _____



HOLLY HILL

FLORIDA

1065 Ridgewood Avenue, Holly Hill, FL 32117

TELEPHONE: (386) 248-9442 PERMITDESK@HOLLYHILLFL.ORG

AGENT/CONSULTANT

NAME: <i>Michael Wise</i>	COMPANY: <i>Wise Custom Builders</i>	
ADDRESS: <i>84 Cunningham Drive</i>		
CITY: <i>New Smyrna Beach</i>	STATE: <i>FL</i>	ZIP: <i>32168</i>
PHONE: <i>(386) 307-6470</i>	EMAIL: <i>wisecustombuilders@yahoo.co</i>	

APPLICATION TYPE/FEE

☒ VARIANCE – RESIDENTIAL	\$350.00 PER VARIANCE
☐ VARIANCE – COMMERCIAL	\$500.00 PER VARIANCE

ATTACHMENT CHECKLIST

☒ APPLICATION
☒ APPLICATION FEE
☐ LIST OF PROPERTY OWNERS REQUIRING INDIVIDUAL NOTIFICATION. THE LIST AND NOTIFICATION LETTER WILL BE PROVIDED TO THE APPLICANT BY CITY STAFF. THE APPLICANT WILL MAIL THE NOTIFICATIONS AT THEIR EXPENSE VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED.
☒ QUESTIONNAIRE
☒ OWNERSHIP DISCLOSURE FORM (ADD'L DOCUMENTATION REQUIRED IF OWNER IS A TRUST OR CORPORATION) <i>See Property Appraiser Info. Sheet</i>
☒ APPLICANT AUTHORIZATION FORM, IF APPLICABLE
☒ ONE SIGNED AND SEALED SURVEY OF THE PROPERTY (NO MORE THAN 2 YEARS OLD).
☒ DETAILED CONCEPTUAL SITE PLAN (SEE ATTACHED SAMPLE SITE PLAN)
☐ LETTERS OF SUPPORT FROM ADJACENT PROPERTY OWNERS, IF ANY
☐ HOME OWNERS ASSOCIATION DRB APPROVALS, IF ANY
☒ PHOTOGRAPHS, IF DESIRED

Attachment: Application (2909 : Variance Request - 1730 Birmingham Avenue)

Altkey: 3189035
RODGERS BURL L

Parcel ID: 424222060010
1730 BIRMINGHAM AVE , HOLLY HILL

Parcel

Short Parcel Id 424222060010
Property Location 1730 BIRMINGHAM AVE, HOLLY HILL, 32117
PC Code 0100 - SINGLE FAMILY
Total Bldgs 1
Neighborhood 2728 - ALABAMA STREETS - HOLLY HILL
Business Name
Homestead Property No

Primary Owner

Owner RODGERS BURL L

In Care Of
Mailing Address 1730 BIRMINGHAM AVE

HOLLY HILL FL 32117
Change Mailing Address Online

All Owners

#	Owner 1	Owner 2	Owner %	Owner Type(s)
0	RODGERS BURL L		100	FS - Fee Simple

Legal

Millage Group 203-HOLLY HILL
Legal Description N 100 FT OF LOTS 1 & 2 & N 100 FT OF E 25 FT OF LOT 3
BLK 6 FLOMICH GARDENS SECTION HOLLY HILL
HEIGHTS MB 10 PG 93 PER OR 4091 PG 3946 PER OR
6060 PG 1443 PER OR 7013 PG 1401 PER OR 7488 PG
4154
Map TWP-RNG-SEC 14 - 32 - 42
Subdivision-Block-Lot 22 - 06 - 0010
Date Created 26-DEC-81
Year Annexed

Special Assessment

Project #	Description	Units	Rate	Amount
0203	HOLLY HILL STORMWATER	1.00	\$96.00	\$96.00

Sales

Book/Page	Instr Type	Inst #	Sale Date	V/I	Sale Price
7488 / 4154	WD-WARRANTY DEED	2017250336	12/20/2017	I	\$222,000
7013 / 1401	WD-WARRANTY DEED	2014130937	07/17/2014	I	\$142,500
6060 / 1443	QC-QUIT CLAIM DEED	2007111104	05/11/2007	I	\$100
4091 / 3946	WD-WARRANTY DEED	1996055673	03/15/1996	I	\$76,000
3860 / 1407	WD-WARRANTY DEED	1993135346	09/15/1993	I	\$72,000
2213 / 0297	WD-WARRANTY DEED		10/15/1980	I	\$51,900

V# _____



1065 Ridgewood Avenue, Holly Hill, FL 32117

TELEPHONE: (386) 248-9442 PERMITDESK@HOLLYHILLFL.ORG

I understand that the application for variance must include all required submittals. Submission of incomplete plans may create delays.

I hereby represent that I have the lawful right and authority to file this application.

B. R. R.
SIGNATURE OF OWNER/AUTHORIZED APPLICANT

12/19/19
DATE

(PROOF OF PROPERTY OWNER'S AUTHORIZATION IS REQUIRED WITH SUBMITTAL IF SIGNED BY SOMEONE OTHER THAN THE PROPERTY OWNER)

Respond completely and fully to all six criteria listed below to demonstrate that the request meets the standards of Land Development Regulations of Holly Hill Sec. 82-317 for the granting of a variance:

1. Describe the special conditions and circumstances that exist which are peculiar to the land, structure, or building involved, and which are not applicable to other lands, structures, or buildings in the same zoning district.

Home is located next to golf course and has had several broken windows and are nervous about even going outside for fear of getting struck by golf ball.

2. Describe how special conditions and circumstances that currently exist are not the result of the actions of the applicant or petitioner. Home is located adjacent to golf course.

V# _____



1065 Ridgewood Avenue, Holly Hill, FL 32117

TELEPHONE: (386) 248-9442 PERMITDESK@HOLLYHILLFL.ORG

3. Explain how the granting of the variance request would not confer on the applicant, or petitioner, any special privilege that is denied by Code to other lands, buildings, or structures in the same zoning district.

Special circumstances due to home being located next to golf course

4. Describe how the literal interpretation of the provisions of the zoning regulations would deprive the applicant, or petitioner, of rights commonly enjoyed by other properties in the same zoning district and would work an unnecessary and undue hardship on the applicant.

The applicant is unable to enjoy the outdoors of their home for fear of being struck by golf ball.

5. Describe how the requested variance is the minimum variance that will make possible the reasonable use of the land, building, or structure.

Easiest way to help remedy golf balls striking the home, vehicles or occupants outside

Attachment: Application (2909 : Variance Request - 1730 Birmingham Avenue)

V# _____

**1065 Ridgewood Avenue, Holly Hill, FL 32117**

TELEPHONE: (386) 248-9442 PERMITDESK@HOLLYHILLFL.ORG

6. Describe how the granting of the variance will be in harmony with the general intent and purpose of this subpart and the city's comprehensive plan, and that such variance will not be injurious to the area involved or otherwise detrimental to the public welfare.

The only view that would be obstructed or affected would be the golf course which is the reason the variance is being requested.

Attachment: Application (2909 : Variance Request - 1730 Birmingham Avenue)

CITY OF HOLLY HILL APPLICANT AUTHORIZATION FORM

(ORIGINAL ONLY)

An authorized applicant is:

- The property owner of record; or
- An agent of said property owner (power of attorney to represent and bind the property owner must be submitted with the application); or
- Contract purchaser (a copy of a fully executed sales contract must be submitted with the application containing a clause or clauses allowing an application to be filed).

I, Burl L. Rodgers, the owner of record for the following described property (Legal Description or Tax/Parcel ID Number or Address) 1730 Birmingham Ave. Holly Hill Fl. 32117 hereby affirm that Wise Custom Builders is hereby designated to act as my authorized agent for the filing of the attached application for a: (CHECK ONE)

☐ Arbor Permit ☐ Special Exception ☒ Variance ☐ Development Plan
☐ Special Event Permit ☐ Vacate ☐ Sign ☐ Other _____

and make binding statements and commitments regarding the request. I certify that I have examined the attached application and that all statements and diagrams submitted are true and accurate to the best of my knowledge. Further, I understand that this application, attachments and fees become part of the Official Records of City of Holly Hill, Florida and are not returnable.

12/23/19
Date

B. Rodgers
Owner's Signature

Burl L. Rodgers
Owner's Name

STATE OF FLORIDA

COUNTY OF Volusia

SWORN TO AND SUBSCRIBED before me, an officer duly authorized in the State of Florida to take acknowledgements, personally appeared Burl Rodgers, who is personally known to me or who has produced a Florida Drivers Lic. as identification and who executed the foregoing instrument and sworn an oath on this 23 day of December, 20 19.



Jymme Kern
NOTARY PUBLIC
STATE OF FLORIDA
Comm# GG197899
Expires 3/19/2022

Jymme Kern
NOTARY PUBLIC



Brian Walker <bwalker@hollyhillfl.org>

Variance Request

2 messages

Brian Walker <bwalker@hollyhillfl.org>
To: Burl Rodgers <rodgersgrinding@gmail.com>

Tue, May 5, 2020 at 10:38 AM

Mr. Rodgers,

Based on our conversation this morning, it is my understanding that you wish to withdraw your request for a front yard setback at 1730 Birmingham Avenue. Please confirm whether or not my understanding is correct.

Brian M. Walker, AICP, CNU-A
Community Development Director
City Planner
City of Holly Hill
[1065 Ridgewood Ave.](#)
[Holly Hill, FL. 32117](#)
[Direct Phone - 386-248-9424](#)
bwalker@hollyhillfl.org
www.hollyhillfl.org

Burl Rodgers <rodgersgrinding@gmail.com>
To: Brian Walker <bwalker@hollyhillfl.org>

Tue, May 5, 2020 at 1:04 PM

Thank you Mr. Walker,

Yes, per our phone conversation this morning 5/5/2020 , I will withdraw the request for the front yard setback variance . Your understanding is correct.

Nice speaking with you, and thank you very much.

Burl Rodgers

[1730 Birmingham Ave.](#)

[Holly Hill , Fl. 32117](#)

Sent from [Mail](#) for Windows 10

[Quoted text hidden]

Florida has a very broad Public Records Law. Virtually all written communications to or from State and Local Officials and employees are public records available to the public and media upon request. The City of Holly Hill's policy does not differentiate between personal and business emails. This means email messages, including your e-mail address and any attachments and information we receive online might be disclosed to any person or media making a public records request. E-mail sent on the City system will be considered public and will only be withheld from

disclosure if deemed confidential or exempt pursuant to State Law. If you are an individual whose identifying information is exempt under 119.071, Florida Statutes, please so indicate in your email or other communication. If you have any questions about the Florida public records law refer to Chapter 119 Florida Statutes.

Attachment: Withdrawl of Front Variance Request (2909 : Variance Request - 1730 Birmingham Avenue)