



**AGENDA
HISTORIC DISTRICT COUNCIL
WORKSHOP
JULY 15, 2021
4:00 PM
CITY HALL COMMISSION CHAMBERS
204 ASH STREET
FERNANDINA BEACH, FL 32034**

- 1. CALL TO ORDER / ROLL CALL / DETERMINATION OF QUORUM**
- 2. PLEDGE OF ALLEGIANCE**
- 3. NEW BUSINESS**
 - 3.1 Project Presentation of Waterfront Seawall by Passero and Associates
Questions and Answers
- 4. PUBLIC COMMENT**
- 5. ADJOURNMENT**

All members of the public are invited to be present and be heard. Persons with disabilities requiring accommodations in order to participate in this program or activity should contact the City Clerk at (904) 310-3115 or TTY/TDD 711 (for the hearing or speech impaired). All interested parties may appear at said meeting and be heard as to the advisability of any action, which may be considered with respect to such matter. For information regarding this matter, please contact the Planning Department (904) 310-3135.

Application: RIG--254--

City of Fernandina Beach53492RIG--254--RIGRIG

Started at: 10/5/2020 01:10 PM - Finalized at: 10/9/2020 11:45 AM

Page: Eligibility Questions
Applicant Name City of Fernandina Beach
Are you a local Florida government or municipality? Yes
Applicant County Nassau
Comprehensive Plan Yes
Page: Grantee's General Info
Grant Type RIG

Provide the Applicant's FEID# that matches the registered listing in My Florida Market Place (MFM) (<https://vendor.myfloridamarketplace.com>)

1. Go to MFMP (<https://vendor.myfloridamarketplace.com>), and login to validate and obtain the correct sequence number for your entity's payment information.
2. Enter your User Name & Password. If unknown enter "publicuser" for the User Name & Password
3. Search through the listings under the detail section, that have the following fields that match your application information for where the applicant's funds are to be delivered to:
 - Entity legal name
 - Full address (physical)
4. Should you not find a listing that matches, please contact MFMP to get a correct entry listed for the Grantee at: https://www.dms.myflorida.com/business_operations/state_purchasing/myfloridamarketplace operations.
5. If your question is not answered by the FAQ's link on MFMP's page, please contact the MFMP Vendor Customer Service Desk at vendorhelp@myfloridamarketplace.com or by phone at 866-352-3776.

Federal Tax ID Number

F596000317

Sequence Number

019

DUNS Number

079192274

Provide current contact information for each. Some information may be duplicative. The grantee's grant manager is responsible for all correspondence with DEP after the grant is awarded and relaying any information necessary to partners and/or subcontractors.

Applicant's Physical Address

204 Ash Street

Applicant's Physical City

Fernandina Beach

Applicant's Physical Zip Code

32034-6423

Applicant's Grant Manager's Name

Lorelei Jacobs

Applicant's Grant Manager's Title

Grants Administrator

Applicant's Grant Manager's Physical Address

204 ASH ST

Applicant's Grant Manager's City

FERNANDINA BEACH

Applicant's Grant Manager's Zip Code

32034-6423

Applicant's Grant Manager's Phone Number

9043103104

Applicant's Grant Manager's Email Address

ljacobs@fbfl.city

Applicant's Authorized Signer's Name

Dale L. Martin

Applicant's Authorized Signer's Title

City Manager

Applicant's Authorized Signer's Physical Address

204 ASH ST

Applicant's Authorized Signer's City

FERNANDINA BEACH

Applicant's Authorized Signer's Zip Code

32034-6423

Applicant's Authorized Signer's Phone Number

9043103101

Applicant's Authorized Signer's Email Address

dmartin@fbfl.city

Applicant's Fiscal Agent's Name

Pauline Testagrose

Applicant's Fiscal Agent's Title

Comptroller

Applicant's Fiscal Agent's Mailing Address

204 ASH ST

Applicant's Fiscal Agent's City

FERNANDINA BEACH

Applicant's Fiscal Agent's Zip

32034-6423

Applicant's Fiscal Agent's Phone Number:

9043103334

Applicant's Fiscal Agent's Email Address

ptestagrose@fbfl.city

Page: Project Information**Entity's Name**

City of Fernandina Beach

RIG Project Type

1. Nature-based options for erosion and flood control, 2. Elevation of public structures, and, 3. Projects specifically included in existing adaptation/resilience plans.

Project Title

Fernandina Beach Comprehensive Historic Downtown Resiliency Plan Segment 2 Project

List the City(ies)/ Town(s)/ Village(s)

Fernandina Beach

Project Location

30.66975178 N, -81.46532897 E

Upload Map

[Download File](#)

State Lands being utilized?

No

PROJECT WORK PLAN

Please review the [RIG Project Types](#) in the title bar. If including any letters of support or other materials, they should specifically address the Work Plan components below.

Project Summary

In 2019, Fernandina Beach embarked on an ambitious project to protect 1.1 mile historic downtown waterfront area from storm surge flooding including sea-level rise by contracting for a comprehensive Amelia Riverfront Study. The Study, now largely-complete, and repeatedly publicly-vetted, provides actionable resiliency recommendations for a nine-phased project, broken into nine segments of the downtown waterfront. This application seeks funding toward construction of a earthen berm and natural shoreline on Segment 2. The estimated cost for these significant resiliency improvements at Segment 2 which will help raise the existing elevations along 900 L.F. of proposed flood line protection will exceed \$500,000.

Project Description

The City of Fernandina Beach ("Fernandina Beach") is Florida's northern-most city on Florida's Atlantic Coast. Although Fernandina Beach has a population of under 13,000, hundreds of thousands of visitors flock to the City's pristine beaches, well-preserved Victorian-era Historic Waterfront Downtown, and annual world-class festivals. Mitigating Sea Level Rise at the Fernandina Beach Historic Downtown Waterfront is the #2 priority of Nassau County's Local Mitigation Strategy (LMS) since 2018. In January 2019, the City of Fernandina Beach completed a "Downtown Waterfront Sea Level Rise" study and public workshop to move forward with actions that increase resilience along the Downtown Waterfront. The study concluded that "the projected (Fernandina Beach Downtown Waterfront) SLR will contribute to increased flooding when combined with annual high tide events and storm surge". In July 2019, the City contracted for an "Amelia Riverfront-Engineering Study" for actionable downtown waterfront stabilization, basemapping, elevation goals, alternatives, and public presentation services. On September 15, 2020, the City received, published, and took public comment about the report "Project Update-Amelia Riverfront Study" that recommended 9 phased improvements (or "Segments") that would raise the elevation along the 1.1 mile long downtown waterfront to a consistent 9.0' NAVD minimum. On September 16, 2020 the City commenced a 30-day online survey to further invite community input. In its FY 2020/2021 Budget, (October 1, 2020 to September 30, 2021), the Fernandina Beach City Commission allocated funding for the final design, permitting, and construction bid work at Segment 2 of the "Project Update-Amelia Riverfront Study" so that this work could be completed prior to the contract execution date of the 2022 FDEP RIG grant contracts. The goal of these efforts is to launch the construction of two of the "Amelia Riverfront-Engineering Study" recommendations through partnership with the Florida Department of Environmental Protection on a Resiliency Improvement Grant (RIG).

PROJECT NEED AND BENEFIT

*Elaborate on specific elements of the project, answering each subsection as requested. More information can be found in the document [RIG Project Types](#) in the title bar. **NOTE: Some Project Types have required deliverables. Please consult the Project Types document for more information on required deliverables.***

A. Explain the demonstrated need, which the project addresses.

The waterfront area of the Historic Downtown in Fernandina Beach is historically subject to flooding due to storm surge and elevated tide conditions during severe weather events. The lowest section of Fernandina Beach's Downtown Waterfront existing sea wall was constructed in 1962, and is nearing the end of its service life. Flooding of roadways, railroads, utilities and historic structures was experienced during the two most recent Hurricanes, Matthew (2016) and Irma (2017). Prompted by concerns of sea-level rise, blue-skyflooding and recent hurricane near-misses, the City began a resiliency master plan assessing vulnerabilities and developing methodologies to protect the historic downtown area. In 2019, the City of Fernandina Beach hired Passero Associates to lead a Resiliency / Hurricane protection study to further understand the City's risk, impact and provide viable solutions to improve the City's resilience to rising waters and future natural disasters. The studies reviewed by Passero and Associates predict with confidence that global mean SLR will rise at least 8 inches, and no more than 6.6 feet by the year 2100. Current flood protection systems provide varying levels of protection ranging from a low point at approximately 3.0' NAVD 88 to high points of 8.8' at North Front Street. Existing systems consist primarily of natural features (existing living shorelines and natural grades) and bulkheads. Bulkhead systems utilize various materials including timber, concrete, and steel. Existing steel sheet pile bulkheads are in poor condition with significant signs of corrosion and concrete bulkheads are experiencing water intrusion causing settlement on landside of bulkhead. According to the nearest NOAA Tidal Station (Fernandina Beach, Station No. 8720030), the tidal range for the Downtown Waterfront Project Area is approximately 6 vertical feet, meaning sunny-day water elevations vary, on average, by 6 feet vertically. The Downtown Waterfront Flooding Assessment assumes a critical flood threshold of +5.0 feet (NAVD88) based on the NOAA Sea-level Rise Viewer tool (Intermediate Scenario). The tool shows that water levels at an approximate elevation of +5.0 feet (NAVD88) lead to significant inundation of the Downtown Waterfront Project Area. This elevation is reported to correspond with a 25 percent annual probability of flood event occurrence (four-year return period). Further, this is the current predicted exposure to the critical flood threshold elevation for the Downtown Waterfront Project Area. Exposure of riverfront Area assets to waters at or above the critical flood threshold of +5.0 feet (NAVD88) will increase with sea-level rise.

A Shoreline Protection Plan was developed utilizing sea level rise simulations. These simulations demonstrated increased flooding due to sea-level rise combined with storm surge and annual high tide events in Fernandina Beach's future. Each scenario unveiling how downtown Fernandina Beach would be further devastated by rising waters, further reinforcing the need for shoreline resiliency protection. of existing timber bulkhead shorelines and natural grades) and bulkheads. Existing steel sheet pile bulkheads are in poor condition with significant signs of corrosion and concrete bulkheads are experiencing water intrusion causing settlement on landside of bulkhead. The waterfront infrastructure consists of several sea wall sections, rip-rap reinforced shorelines and multiple stormwater discharge points. The Downtown waterfront along the Amelia River extends from Beech street north to Calhoun Street, and contains the Fernandina Beach Marina, and is the focal point of the historic downtown. The affected area consists of historic structures (circa 1800) as well as newer construction and a sanitary sewer lift station. City Hall is located one block east of the waterfront and the recently restored historic train depot, which houses the Amelia Island Convention and Visitors Bureau, is counted among buildings directly-affected by periodic flooding.

B. Explain how the proposed project fits into one or more of the Project Types.

In order of importance:

Project Type 1: The Fernandina Beach Segment 2 Project will construct a living shoreline on a heavily-eroded section of the Fernandina Beach Downtown Waterfront at the City's Marina location. The living shoreline enhancements includes approximately 600 L.F. of oyster shells in burlap bags placed 30' maximum from the Mean High-Water Line (MHWL) within the City's non-sovereign submerged lands. The oyster bags would provide a natural barrier protecting the proposed saltmarsh vegetation enhancements while working together to increase substrate stabilization. These efforts would prevent the loss of sediment from the uplands and marsh to the Amelia River channel, potentially reducing maintenance dredging of the river and damage to adjacent uplands. The proposed ecosystem restoration would meet the requirements under Jacksonville District 2017 Nationwide Permits – 54. Living Shorelines. Proposed living shorelines, revitalize ecosystem preserving natural resources, non-natural barriers, and modeled after designs provided by the U.S. Army Corps of Engineers (USACE). The riverfront shoreline protection design concepts are based on USACE Hurricane and Storm Damage Risk Reduction System Design Guidelines. Additional "green-gray" improvements constructed through the Fernandina Beach Segment 2 Project include an earthen berm (with revetment mat) that ties into the living shorelines at Parking Lots C and D. Baseline monitoring and monitoring for at least one year following construction will be performed. The suitability of the living shoreline was determined by providing an environmental assessment that identified and flagged the existing wetlands and a topographical survey delineating the wetlands, Mean High Water Line (MHWL) and edge of tidal vegetation. A Sovereign Submerged Land (SSL) title determination Segment 2's riverfront is not sovereign, so any work in uplands is easily permittable under NW Permit 54 for living shoreline enhancements and allow the placement of oyster bags up to 30' from the MHWL. Also, it was observed in the upland flats that oyster shell are trying to take hold to form a natural barrier.

Project Type 2: Elevation or relocation of public structures. The shoreline resiliency protection plan is part of a formal planning process addressing coastal resiliency mitigation strategies against BlueSky Tide Flooding, Storm Surge and Sea-level Rise along the historical downtown riverfront. Within the proposed project area is a combination of raised earthen berms with sub-grade stabilization raising the existing natural grades 2.0' to 3.0' to +9.0' NAVD88 and a composite sheet pile bulkhead with concrete cap placed within 36" in front of the existing timber bulkhead increasing the protection elevations by approximately +4.0' to +9.0' NAVD88. These mitigation strategies are in anticipation of a future proposed development allowing these structures to be built two feet above the base flood elevation (BFE) to the required design flood elevation (DFE).

Project Type 3: Projects specifically included in existing adaptation/resilience plans
The shoreline resiliency protection plan is the continuation of the City's Resiliency Master Plan that assesses vulnerabilities and developed methodologies to protect the Historic Downtown. Early this year, Phase One conceptual plans were submitted to the Department of the Army, Corps of Engineers (USACE) so they can see the total scope of development up-front. By doing so, the City is well-positioned to submit completed construction designs for the current phase with conceptual future phases shown for a 10-year permit for build-out. Permit modifications would be provided as the plans progresses through subsequent phases to show complete design. On the permit application with (USACE) for this project is known as "Fernandina Beach, City of / Amelia Riverfront Stabilization" and has been assigned permit number: SAJ-2020-01718, including Terri Mashour (USACE) assigned as the Project Manager.

C. Discuss how the project is feasible and can be completed by the grant period deadline.

FDEP RIG grant criteria clearly states "Funding is available only for project work initiated on July 1, 2021, or after the agreement fully executed date, whichever comes later, and COMPLETED BY April 30, 2022." This grant application, titled "Fernandina Beach Comprehensive Historic Downtown Resiliency Plan Segment 2 Project" reflects Fernandina Beach Historic Downtown Waterfront Resiliency Improvements have been a long-established, publicly-workshopped, fully-vetted Fernandina Beach City Commission priority. "Fernandina Downtown Shoreline Stabilization" has been the second highest priority of the Nassau County Local Mitigation Strategy (LMS) for the past three years; however HMGP grant funds have been unavailable, given that HMGP requires projects that present a solution in their entirety and strong evidence of repetitive loss structures, rather than allowing funding for phases of a long-term resiliency solution. The project feasibility has been established in the Waterfront Resiliency study by Passero and Associates, which includes conceptual engineering design. The required permit application has been submitted to the Army Corps of Engineers, and pre-application meetings indicate that there are no obstacles to permitting as designed. The City owns all property required for implementation of the Segment 2 Downtown Waterfront improvements described in this grant application. In the last Fiscal Year, the City contracted for and completed initial permitting and design work for the 1.1 mile downtown waterfront area, including for Segment 2. The City has budgeted in the current Fiscal Year for the costs of all remaining permitting, design, and construction bid work, with the goal to have this completed to allow construction of the Segment 2 improvements commence August 2022. This level of planning and permitting makes the project feasible to be completed within the grant period and Fernandina Beach is fully-committed to successfully completing the Segment 2 improvements prior to April 30, 2022. As a complement to the work requested through this application, the City of Fernandina Beach has already secured a \$250,000 grant from the Florida Inland Navigation District (FIND) to be matched with \$250,000 of City funds, to replace the aged waterfront Boardwalk in Segment 2 with a durable, elevated boardwalk, once the earthen berm and natural shoreline in Segment 2 is completed.

Public vetting on the proposed Waterfront Resiliency Improvement Study improvements, including Segment 2, performed by Passero and Associates include the following activities:

August 6, 2019 – Agenda'ed and Discussed at City Commission Meeting

September 6, 2019 – Agenda'ed and Discussed at Riverfront City Hall Public Meeting

November 19, 2019 – Agenda'ed and Discussed at City Commission Meeting – Riverfront Presentation

December 17, 2019 – Agenda'ed and Discussed at Amelia Riverfront Team Coordination Meeting and Steering Committee at Municipal Golf Course

January 28, 2020 – Agenda'ed and Discussed at Waterfront Park Development Visioning Session Work Shop at Municipal Golf Course

September 15, 2020 - Agenda'ed and Discussed at City Commission Meeting – Riverfront Presentation

D. Is the project a follow-up of a previous RPG-funded project?

No

Project Outcomes

Current flood protection systems along the 1.1 mile of Fernandina Beach's downtown waterfront provide flood protection ranging from a low of approximately 3.0' NAVD 88 to a high of 8.8. All protection measures developed within the City's comprehensive "Amelia Riverfront Study", including the two Segment 2 improvements sought through this grant application, are designed to combine to provide an unbroken elevation of +9.0' NAVD 88 along the downtown riverfront which would reduce long-term risk to people and property from rising waters and natural disasters. This grant application seeks funding for a "hybrid" living shoreline and an earthen berm with revetment mat at Segment 2. In addition to supporting an increased elevation, it's expected that the living shoreline will have minimal maintenance as they tend to sustain naturally over time, and provide improved natural sediment movement, improved water quality by filtering pollutants, improved habitat for animals, fish and birds, and a beautiful waterfront feature whose gradual sloping helps maintain a plant community that can adapt as sea levels rise. Anticipated outcomes of the new earth berm are that it will help maintain a natural environment, have natural materials to stabilize the structure, and is durable with less maintenance than "core walls".

Future Recommendations & Estimated Costs

In September and October 2020, the Fernandina Beach City Commission received an Engineering/Feasibility Study titled "Amelia Riverfront Resiliency Phases 1-2", which provides extremely specific resiliency improvement recommendations for the entire 1.1 mile Downtown Waterfront area. The new Study contained sea level rise simulations and provided flood protection methodologies for 7.0' NAVD 88 and 9.0' NAVD 88 through proposed upgrades to City-owned property generally consisting of: Living Shorelines, concrete block mat, composite/steel sheet piles with reinforced concrete bulkheads, concrete secant piles, back-flow protection for outflow storm drainage and flood defense systems. Recommendations in the study were broken into 9 segments, which combined are estimated to cost \$16 - \$20 million.

Nine distinct Segments of the 1.1 mile Downtown Waterfront will, as funding becomes available, build upon the improvements requested at Segment 2 in this application and are:

Segment 1: Retaining wall or berm.

Segment 2: The earthen berm and living shoreline at Parking Lot C and D are the subject of this RIG grant application requesting \$500,000. The remainder of Segment 2 Improvements are a retaining wall and hydro-defense plank system, and a composite bulkhead system completes this section. \$2 million.

Segment 3: Boat Launch Ramp repairs consisting of a new "I-Wall" at each side of opening with a Hydro-defense plank system and a new composite bulkhead

Segment 4: New concrete secant pile system at Parking Lot B.

Segment 5: Structural Repairs at over-water Brett's Restaurant.

Segment 6: New concrete secant pile system.

Segment 7: Bulkhead or living shoreline enhancements protecting to 7.0' NAVD88 and an "I-Wall" to protection to 9.0' NAVD 88.

Segment 8: Hydro-defense plank system and retaining wall.

Segment 9: Retaining wall protection and road elevation.

Design Plans

[Download File](#)

Permits

No File Uploaded

Page: Budget Information

Budget Narrative Description

Since 2019, Fernandina Beach has contracted with an engineering firm to develop a comprehensive Historic Downtown Waterfront Resiliency Plan. The Plan has evolved over the past year, as public workshops, surveying, and City Commission presentations of the Plan were completed. In May 2020, Fernandina Beach contracted for an engineering study to develop the budget for the nine segments of our downtown waterfront, with a focus on Segment 2. Additionally, the City completed the permit application needed at Segment 2 and has funded the last Segment 2 design and permitting expenses in our FY 20-21 budget, which commenced 10/01/2020. The estimated construction costs for Segment 2 improvements to raise elevations along 900 L.F. of Segment 2 is \$2.5 million and include construction of a natural shoreline, an earthen berm, a composite bulkhead, and a retaining wall. This Fernandina Beach Comprehensive Historic Downtown Resiliency Plan - Segment 2 Project application seeks funding for construction of the two nature-based structures needed at Segment 2: the natural living shoreline and the earthen berm. The living shoreline enhancements would mimic natural conditions and adapt to the environment around them with the placement of oyster bags, tidal planting with the earthen berm providing embankment stabilization.

OTHER PROJECT FUNDING SOURCES

Other Funding Source Names

Work Performed by:

Sub-Contractor Only

Sub-Contractor's Information.

All Sub-Contractors who will be performing work on this project, to be paid out using the requested funds from DEP, must be listed in the table below.

Sub-contractor 1 Company Name

Marine Construction Company to Be Selected Through Bid

Sub-contractor 1 Contact Person Name

Sub-contractor 1 Phone Number

Sub-contractor Email 1

Sub-contractor 1 Address

Florida US

Sub-contractor 1 Amount Table

Tasks

Task #: 1

Amount: 250000

Task #: 2

Amount: 250000

aliasa198695ab7ae43468be558ce6553e4d2

No

Page: Tasks & Deliverables

PROJECT TIMELINE with TASKS & DELIVERABLES DETAILS

*This is where each task is listed with the title, due date for submission of all deliverables by task, and total of task funding amount requested. **To avoid late submittals and financial consequences, be sure to allow enough time for submitting deliverables.***

Details for each task to include:

- Title,
- Goal,
- Description,
- Listing of deliverables,
- Total task amount, and
- Budget category

RIG Project Timeline Chart

Task #s

A. Task#: 1

B. Task Title: Living Shoreline at Segment 2

C. Task Goal: The installation of the Natural Living Shoreline described in detail in Section D. below.

D. Task Description: An integral part of the shoreline resiliency protection plan is the proposed living shoreline habitat enhancements to help mitigate the current erosion problems along the riverbank. The living shoreline enhancements proposed within this grant application to be located at Section 2 of Fernandina Beach's Downtown Waterfront includes approximately 600 L.F. of oyster shells in burlap bags placed 30' maximum from the Mean High-Water Line (MHWL) within the City's non-sovereign submerged lands. The oyster bags would provide a natural barrier protecting the proposed saltmarsh vegetation enhancements while working together to increase substrate stabilization. These efforts would prevent the loss of sediment from the uplands and marsh to the Amelia River channel, potentially reducing maintenance dredging of the river and damage to adjacent uplands. The proposed ecosystem restoration would meet the requirements under Jacksonville District 2017 Nationwide Permits – 54. Living Shorelines.

E. Task Deliverable(s) 1: Construction {bd7fb87a-7575-4ccd-a508-23919bdd0d01} {bca7a63b-290a-471a-b178-f8d36ff5341b} {6076ba89-1692-4dc6-bd7b-b5a649895cbd} {e3fdbfdd-3e7f-42cf-8d0f-ae7c584fa8c6} {57dc5663-8f5a-4cf3-b5e2-da284b48e8ac} {14e11bfa-a300-4c7c-927e-bcf35c5b2643} {ee0be8d4-c094-4098-ba55-a00c03ed8f21} {c9ca5323-baa4-456d-b13a-289933ec86e9} {ca957f78-e5eb-4041-ba8f-8de34c4245fe}

F. Task Due Date: 3/30/2022

G. Total Task Amount: 250000

H. Task Budget Category: Sub-Contractor Only (CS)

A. Task#: 2

B. Task Title: Earthen Berm and Stabilization at Segment 2

C. Task Goal: Construction of the Earthen Berm and Stabilization described in Section D below.

D. Task Description: The shoreline resiliency protection plan adopted by the City of Fernandina Beach is part of a formal planning process addressing coastal resiliency mitigation strategies against BlueSky Tide Flooding, Storm Surge and Sea-level Rise along the historical downtown riverfront. Within the proposed project area is a combination of raised earthen berms with sub-grade stabilization raising the existing natural grades 2.0' to 3.0' to +9.0' NAVD88. These mitigation strategies are in anticipation of a future proposed development allowing these structures to be built two feet above the base flood elevation (BFE) to the required design flood elevation (DFE).

E. Task Deliverable(s) 1: Construction {bd7fb87a-7575-4ccd-a508-23919bdd0d01} {bca7a63b-290a-471a-b178-f8d36ff5341b} {6076ba89-1692-4dc6-bd7b-b5a649895cbd} {e3fdbfdd-3e7f-42cf-8d0f-ae7c584fa8c6} {57dc5663-8f5a-4cf3-b5e2-da284b48e8ac} {14e11bfa-a300-4c7c-927e-bcf35c5b2643} {ee0be8d4-c094-4098-ba55-a00c03ed8f21} {c9ca5323-baa4-456d-b13a-289933ec86e9} {ca957f78-e5eb-4041-ba8f-8de34c4245fe}

F. Task Due Date: 3/30/2022

G. Total Task Amount: 250000

H. Task Budget Category: Sub-Contractor Only (CS)

Page: Certification Page

Grantee's Certification Statement

"By signing this Statement page, the undersigned certifies that:

- a. This application is in all respects fair and submitted in good faith without collusion or fraud;
- b. If selected through this application process, the recipient will work in good faith and in partnership with the Florida Resilient Coastlines Program (FRCP) to manage its subcontractors in a timely and accurate manner;
- c. Any funds awarded as a result of this application pprocess will not be used to supplant or replace any state or local funds;
- d. Any funds awarded as a result of this application process will not be used as matching funds to apply for or recieve other state funds;
- e. The applicant's local governement's adopted comprehensive plan has been found to be in compliance with Chapter 163, Part II, F.S.;
- f. The undersigned has full authority to bind the applicant."

Please be advised that the selection of the checkboxes below are acting as a signature box on your behalf, as indicated in the field titles.

Grantee's Authorized Signer's Name

Dale L. Martin

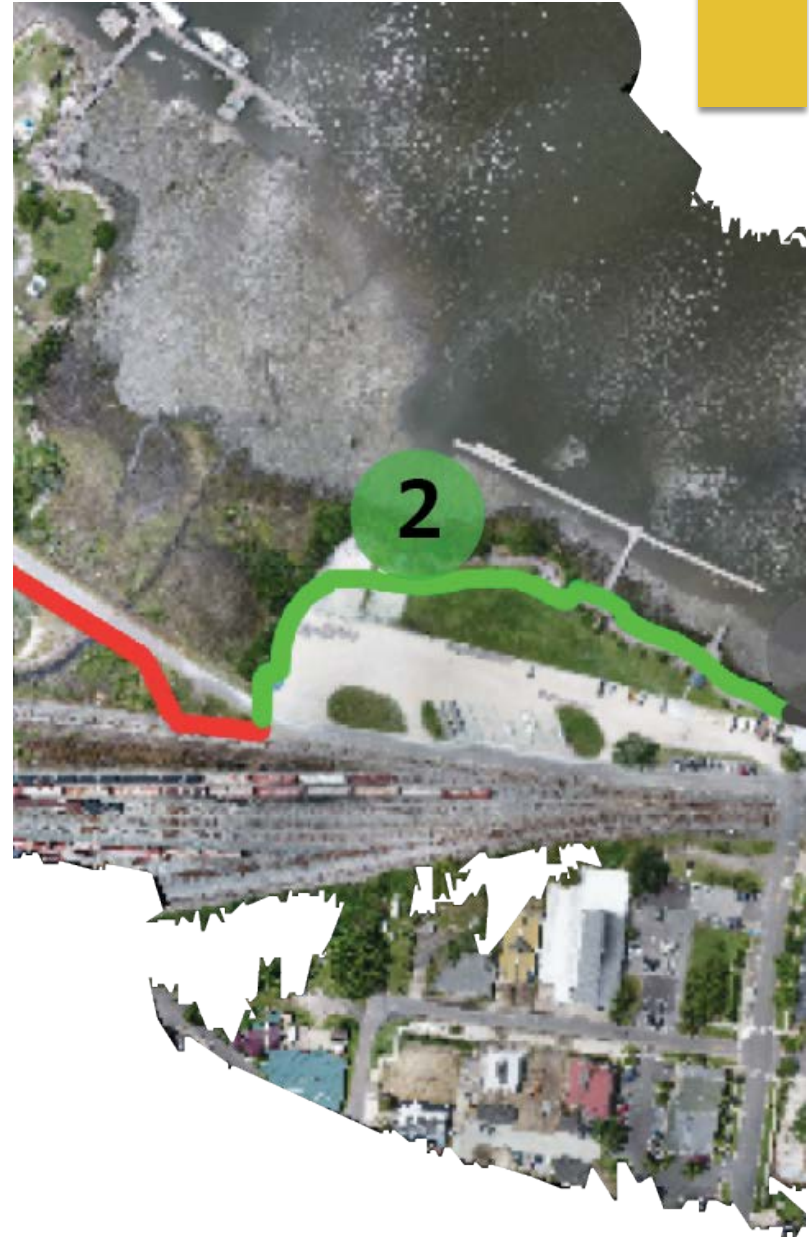
Do you Agree to the Certification Statement?

I agree

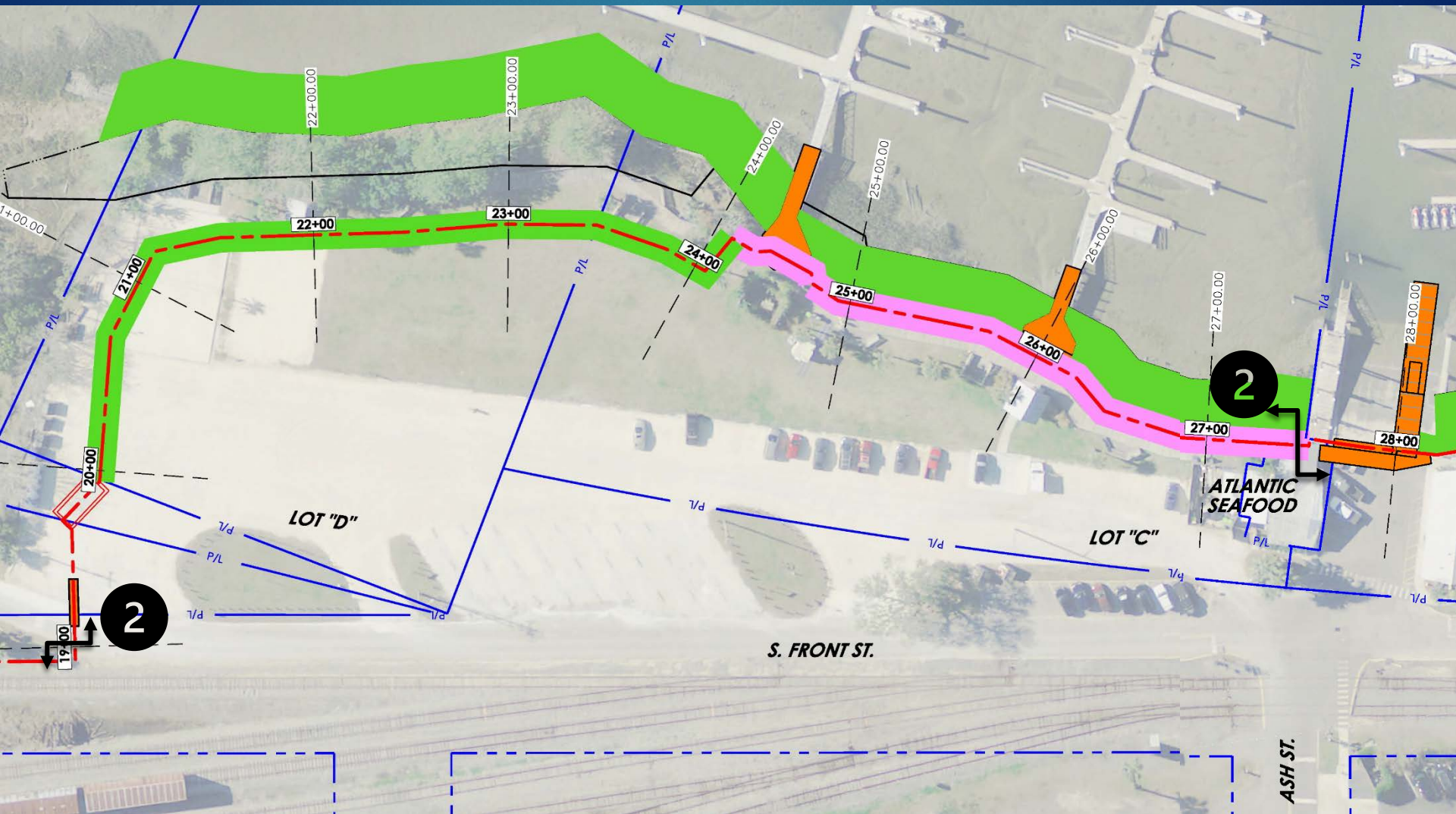


Segment 2 Lots C & D

- ▶ Retaining wall
- ▶ Earthen berm, elevated walkway, enhanced living shoreline
- ▶ Composite Bulkhead (small section to boat ramp)



Segment 2 (Lots C & D)



9 Segments (Phases) of Fernandina Beach's Historic Downtown Waterfront Resiliency Plan

Funding for the Natural Shoreline and Earthen Berm of Segment 2 is Requested from the Florida Department of Environmental Protection
Is Requested through the Fernandina Beach Comprehensive Historic Downtown Resiliency Plan Segment 2 Project Grant Application
Offered through the Office of Resilience & Coastal Protection
Florida Resilient Coastlines Program. Resilient Implementation Grant





ENGINEERING / FEASIBILITY STUDY

Amelia Riverfront Resiliency Phases 1-2

Front Street

Fernandina Beach, FL 32034

Prepared by:

PA PASSERO ASSOCIATES
engineering architecture

October 5, 2020

DRAFT

PROGRAM INFORMATION

Project	Amelia Riverfront - Engineering / Feasibility Resiliency Study
Owner/Client	City of Fernandina Beach, Florida 204 Ash St. Fernandina Beach, FL 32034
Passero Project Numbers	99000047.0090, .0092, .92RR
Design Team	Architectural, Structural and Civil Engineering Passero Associates 4730 Casa Cola Way, Suite 200 St. Augustine, FL 32095 Mechanical, Electrical and Plumbing Engineer: Promus 518 Black Canyon Park Canton, GA 30114 Environmental Permitting: Environmental Resource Solutions <i>a division of SES Energy Services, LLC</i> 3550 St. Johns Bluff Road South Jacksonville, FL 32224 Geo-technical Exploration: ECS Florida, LLC 7064 Davis Creek Road Jacksonville, FL 32256 Topographic Survey: Manzie & Drake Land Surveying 117 South 9th St. Fernandina Beach, FL 32034 Cost Consulting: Thomas May Construction Company 310 College Drive Orange Park, FL 32065 Railway Consultant: Railway Project Consultants, LLC Jacksonville, FL

ACKNOWLEDGMENTS

Core Committee

John Miller, Mayor
Len Kreger, Vice Mayor
Mike Lednovich, City Commissioner
Philip Chapman, City Commissioner
Ronald "Chip" Ross, City Commissioner
Dale Martin, City Manager, City of Fernandina Beach

Consultant Team

Architect: Christopher Nardone, AIA, Passero Associates
Architect: Justin Vollenweider, AIA, CSI-CDT, Passero Associates
Structural Engineer: Patrick Williams, PE, SE, Passero Associates
Civil Engineer: Matt Singletary, PE, Passero Associates
Mechanical, Electrical, Plumbing Engineer: Darin Frick, PE, Promus
Environmental Permitting: Johnathan Summerfield, PWS, ERS
Geo-technical: Robert Clark, PE, ECS Florida, Inc.
Topographic Survey: Michael Manzie, PLS, Manzie & Drake Land Surveying
Cost Consultant: Keith Ward, Thomas May Construction Company
Railway Consultant: Jacob Smith, Railway Project Consultant

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- 1.6 Preferred Solution
- 1.7 Cost Summary
- 1.8 Areas for Further Study

02 RESILIENCY AND RAILROAD CROSSINGS AT ASH, CENTRE AND ALACHUA STREETS (PHASE 1A)

- 2.1 Introduction
- 2.2 Study Findings
- 2.3 Preferred Solution
- 2.4 Cost Summary
- 2.5 Areas for Further Study

03 PARKING LOTS C & D (PHASE 2)

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- 3.2 Updates to Resiliency Masterplan (Phase 1)
- 3.3 Preferred Solution
- 3.4 Alternative Approaches to the Preferred Solution
- 3.5 Cost Summary
- 3.6 Areas for Further Study

04 APPENDIX

- A Opinion of Probable Costs
- B Phase 1 & 2 - Drawings
- C Phase 1a - Railroad Drawings
- D Geo-technical Report
- E Proposal from Giken
- F Proposal from Malcom Drilling Company, Inc.
- G Powerpoint Presentation to City Commissioners
September 15, 2020
- H Geophysical Investigation Report
- I Wetland Flagging Map
- J Composite Sheet Pile Information
- K Platipus Earth Anchor Brochure
- L WASTOP - Inline Check Valve Brochure
- M Red Valve - Check Valve Brochure



Brett's to Front Street (North) (Segments 5-9)



Parking Lots C & D to Brett's (Segments 2-5)



Parking Lots C & D to Rayonier (South) (Segments 1-2)

01 Resiliency Masterplan Along Front Street

1.1 INTRODUCTION

The City of Fernandina Beach is a culturally rich historical city, located on an inland waterway (Amelia River), vulnerable to Storm Surge and Sea-Level Rise experiencing blue-sky flooding several times per year. Recent “near-misses” in 2016 (Hurricane Matthew) and 2017 (Hurricane Irma) caused significant damage to downtown and the marina; solidifying the City’s need to enhance shoreline protection along the Amelia Riverfront.

This report is the culmination of a year-long Resiliency / Hurricane protection study identifying current riverfront protection and proposing a preferred (phase-able) solution to mitigate risk and impact from future natural disasters.



**Above aerial drone image looking south along Front Street*

1.2 BACKGROUND

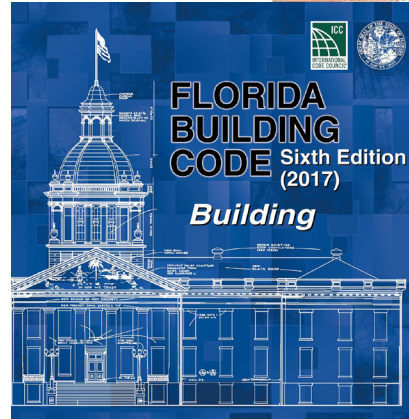
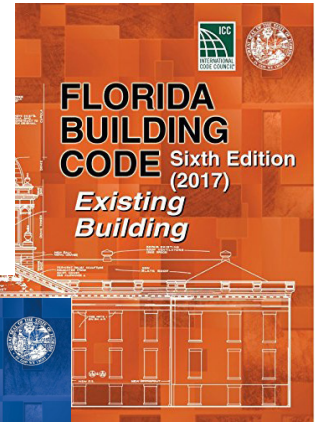
Prompted by concerns of sea-level rise, blue-sky flooding and recent hurricane near-misses, the City began a resiliency master plan assessing vulnerabilities and developing methodologies to protect the historic downtown area. In 2019, the City of Fernandina Beach hired Passero Associates to lead a Resiliency / Hurricane protection study to further understand the City’s risk, impact and provide viable solutions to improve the City’s resilience to rising waters and future natural disasters. This study is a culmination of previous studies with an intent to provide the City a path forward. The following is a brief overview of some of the previous studies:

- In collaboration with DEO and National Oceanic and Atmospheric Administration (NOAA) office for Coastal Management, a study was conducted utilizing NOAA’s Coastal Flood Exposer Mapper and University of Florida’s GeoPlan Sea Level Scenario Sketch Planning Tool (GIS Data: Sea Level Rise (SLR) Inundation Surfaces). This assessment addressed the City’s vulnerability to sea-level rise and impact on City’s infrastructure, over a long period of time. The report predicted sea-level rise of 7” by 2060, 12” by 2080 and 18” by 2100.
- NOAA Technical Report OAR CPO-1; Global Sea Level Rise Scenarios for the United States National Climate Assessment, Dec. 2, 2012 - Historical trends provide valuable data regarding global Sea Level Rise (SLR), this recent study suggests an increase of the rate and magnitude of SLR. Scenarios do not predict future change but describe potential future conditions in a manner that supports planning. The studies predict with confidence that global mean SLR will rise at least 8 inches, and no more than 6.6 feet by the year 2100. The scenarios presented in this report reflect the range of predictions and the impact on the Fernandina Beach Waterfront.
- Additional References concerning climate change impacting sea-levels:
 - o NESDIS 149 - NOAA State Climate Summaries - <https://statesummaries.ncics.org/chapter/fl/>
 - o U.S. Army Corps of Engineers (USACE) Sea-Level Change Curve Calculator (Version 2019.21) - http://corpsmapu.usace.army.mil/rccinfo/slc/slcc_calc.html

1.3 STANDARDS AND RESOURCES

Applicable Codes and Reference Standards include:

- Florida Building Code, 6th edition, 2017 (full series)
- NFPA 72 (2019): National Fire Alarm and Signaling Code
- NFPA 1 (2015): Fire Code and NFPA 101: Life Safety Code
- ASCE 7 (2016) - Minimum Design Loads for Buildings and Other Structures
- ASCE 24 (2014) - Flood Resistant Design and Construction
- FEMA (Federal Emergency Management Agency):
 - Using ASCE 24 for Hazard Mitigation Assistance (January 25, 2018)
 - Guidance for Applying ASCE 24 Engineering Standards to HMA Flood Retrofitting and Reconstruction Projects (November, 2013)
 - Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning (state and local mitigation planning how-to guide, FEMA 386-6, May 2005)
 - Flood Insurance Rate Map (FIRM) August 2, 2017
 - Highlights of ASCE 24-14: Flood Resistant Design and Construction (July, 2015)
 - Flood Insurance Study (FIS) (August 2, 2017)
 - Community Rating System (CRS)
- Fernandina Beach, FL - Municipal Code (March 25, 2020)
- Fernandina Beach, FL - Land Development Code (February 2019)
- Public Project Manual, Engineering ES Services a Genesee & Wyoming Company, Dated: April 2019
- FDOT Standard Plans, Railroad Grade Crossings Traffic Control Devices, Index 509 – 070, Dated: 11/01/17
- US Department of Transportation Federal Highway Administration, Manual on Uniform Traffic Control Devices for Street and Highways, 2009 Edition
- US Department of Transportation Federal Highway Administration, Railroad-Highway Grade Crossing Handbook, Revised Second Edition August 2007
- Florida Administrative Code, Rule Chapter 14-57: Railroad Safety and Clearance Standards, and Public Railroad-Highway Grade Crossings, Effective Date: 10/09/2011
- Florida Statutes (2019)
- Northeast Florida Regional Council (NEFRC)
- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Army Corps of Engineers (USACE) - Hurricane and Storm Damage Risk Reduction System Design Guidelines, New Orleans District Engineering Division with Revisions through June 2012
- Florida Department of Environmental Protection (FDEP)
- Florida Fish and Wildlife Conservation Commission (FWC) - Living Shorelines
- National Park Service (NPS) - Coastal Adaption Strategies Handbook



FEMA

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

1.4 STUDY FINDINGS

The Resiliency Masterplan addresses areas most susceptible to sunny-day flooding during high-tide (flooding resulting from rising water levels) along the Downtown Waterfront Project Area along Front Street. Current flood protection systems provide varying levels of protection ranging from a low point at approximately 3.0' NAVD 88 (at Simmons property) to high points of 8.0' at South Front Street and 8.8' at North Front Street. Existing systems consist primarily of natural features (existing living shorelines and natural grades) and bulkheads. Bulkhead systems utilize various materials including timber, concrete, and steel. Existing steel sheet pile bulkheads are poor condition with significant signs of corrosion and concrete bulkheads are experiencing water intrusion causing settlement on landside of bulkhead.



**Above aerial drone image of Northern portion of project area*

According to the nearest NOAA Tidal Station (Fernandina Beach, Station No. 8720030), the tidal range for the Downtown Waterfront Project Area is approximately 6 vertical feet, meaning sunny-day water elevations vary, on average, by 6 feet vertically.

The Downtown Waterfront Flooding Assessment assumes a critical flood threshold of +5.0 feet (NAVD88) based on the NOAA Sea-level Rise Viewer tool (Intermediate Scenario). The tool shows that water levels at an approximate elevation of +5.0 feet (NAVD88) lead to significant inundation of the Downtown Waterfront Project Area. This elevation is reported to correspond with a 25 percent annual probability of flood event occurrence (four-year return period). Further, this is the current predicted exposure to the critical flood threshold elevation for the Downtown Waterfront Project Area. Exposure of riverfront Area assets to waters at or above the critical flood threshold of +5.0 feet (NAVD88) will increase with sea-level rise.

**Below image of existing timber bulkhead*



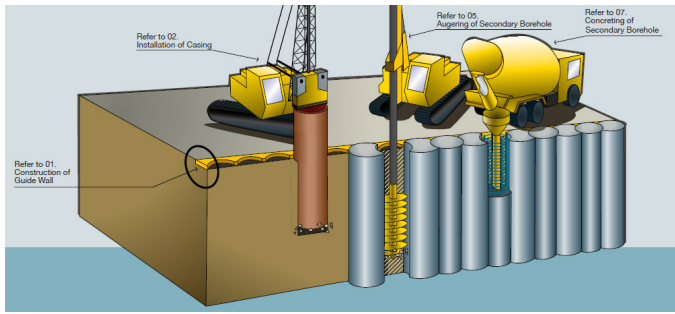
A Shoreline Protection Plan was developed utilizing sea-level rise simulations. These simulations reflect increased flooding due to sea-level rise combined with storm surge and annual high tide events. Each scenario unveiling how downtown Fernandina Beach would be further devastated by rising waters, further reinforcing the need for shoreline resiliency protection.

The Shoreline Protection Plan also provided flood protection methodologies for 7.0' NAVD 88 and 9.0' NAVD 88 through proposed upgrades to Front Street right of ways and City owned property generally consisting of: Living Shorelines, concrete block mat, composite/steel sheet piles with reinforced concrete bulkheads, concrete secant piles, back-flow protection for outflow storm drainage and flood defense systems. The next section (section 1.5) further describes protection methodologies considered.

1.5 ALTERNATIVES

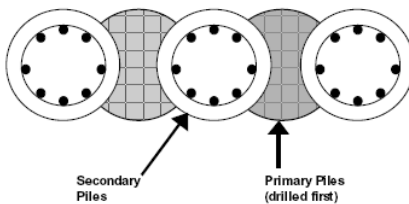
1 Secant Pile Walls

Sources and Images for Secant Wall Systems: railssystem.net



Secant pile walls work by constructing interlocking reinforced concrete piles. Piles are cast-in-situ utilizing steel rebar or beams for reinforcement. Construction begins with female/soft piles followed by male/hard piles intersecting previously cast female/soft piles.

Secant pile walls are usually installed as retaining structures and support systems for deep foundations, retaining elements and load-bearing walls. They can also be designed and constructed to be water resistant and stop water flow.



The primary advantage of secant pile walls is the minimal disturbance they cause to adjacent structures and ability to install in densely populated areas. This would allow existing bulkheads to remain in place and would limit disruptions to existing tidal plants, sidewalks, docks, landscaping and utilities. Other advantages:

- Increased construction alignment flexibility
- Increased wall stiffness compared to sheet piles
- Can be installed in difficult ground (cobbles/boulders)
- Less noisy construction

The main disadvantage is ability to provide total waterproofing without additional costs. Other disadvantages:

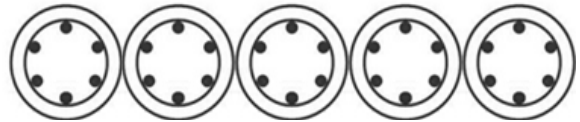
- Vertical tolerances may be hard to achieve for deep piles
- Increased cost compared to sheet pile walls

Secant Pile Wall Variations

1a Tangent Pile Walls are constructed with no overlap and ideally one pile touches the other. Compared to secant pile walls, tangent pile walls offer the following advantages:

- Increased construction alignment flexibility
- Easier and quicker construction

Disadvantage: Can't be used in high groundwater tables without dewatering.



1b Secant Pile Wall - Hard/Soft or Hard/Firm
Where short term water retention is required this system offers the most cost-effective and rapid solution. The wall consists of interlocking bored piles. Primary piles are constructed first using a 'soft' cement-bentonite mix (commonly 1N/mm²) or 'firm' concrete (commonly 10N/mm²). Secondary piles, formed in structural reinforced concrete, are then installed between the primary piles with a typical interlock of 150mm. These walls may need a reinforced concrete lining for permanent works applications, depending on the particular requirements of the project.

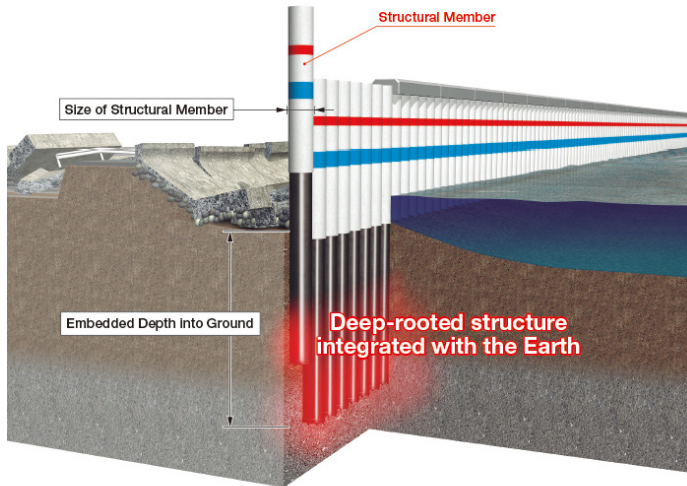


1c Secant Wall - Hard/Hard
Hard/hard wall construction is very similar to a hard/firm wall but in this case the primary piles are constructed in higher strength concrete and may be reinforced. Heavy duty rotary piling rigs, using tools fitted with specially designed cutting heads, are necessary to cut the secondary piles. Since structural concrete is used throughout there may be no need to provide a lining wall. The end product provides a fully concreted face and can be an effective alternative to diaphragm wall construction.



2 Press-in Pile System (Silent Piler by Giken)

Sources and Images: giken.com



Pile penetration methods can be classified as either dynamic penetration or static penetration. Dynamic penetration inevitably generates excessive noise and vibration due to reliance on percussive or vibratory energy. The dynamic penetration method is excluded from this analysis due to the excessive noise and impact to the environment.

Press-in Method: piles are installed with static load generated from hydraulic rams. The reaction for the press-in force is derived from extraction resistance of previously driven piles. This integration with the Earth is why a small press-in machine can generate greater force not requiring traditional percussive or vibratory energy to drive piles. The reduced equipment size lends this method to work conditions on constrained sites.

There are four typical shapes for press-in piles; however, tubular steel sheet piles are preferred due to their high strength and increased durability. Tubular steel piles are also suitable for protection against floods with tidal waves and countermeasures for rivers.

The primary advantage, of press-in piles, is the non-vibratory (with minimal noise) installation which reduces impact on adjacent structures and the environment.

Other advantages:

- **Environmental Protection:** no construction pollution like noise and vibration.
- **Installation Flexibility:** can be installed in locations where space is limited with no need for excavating.
- **Suitable for difficult underground conditions.**
- **No need for temporary platforms or sheet piling cofferdams.**
- **Soil displacement can be minimized** by employing a rotary cutting mechanism with special cutting bits at the pile toe, allowing more environmentally friendly piling work that is not disruptive to existing tidal plants.
- **Various tubular pile diameter sizes, configurations and combinations with better piles** can be used with the Gyro Piler allowing a wide range of economically optimal structure designs.

Implant Structures compared to Traditional Gravity Structures			
Implant Structure	Durability	Resiliency	Footprint
	High	High	Small
	Low	Low	Large

Many of the disadvantages associated with sheet piling are lessened through use of the press-in method; however, some disadvantages remain, as follows:

- Currently limited to sites where the static load capacity of the machine is above the maximum expected resistance.
- Cost, more expensive than other methods.

3 Living Shoreline

Sources and Images: delawarelivingshorelines.org,
floridalivingshorelines.com

A "living" shoreline is a nature-based structure built on the edge of a shoreline using natural materials. Living shoreline systems are environmentally-friendly alternatives to traditional "hardened" structures like rip-rap or sea walls designed to prevent erosion, limit sediment contamination or improve water quality.

Living shorelines mimic natural conditions and adapt to the environment around them. 'Hard' systems (bulkheads, pilings, retaining walls) are static, unchanging, often resulting in scouring, structural damage and shoreline erosion downstream.

There are two basic types of living shorelines.

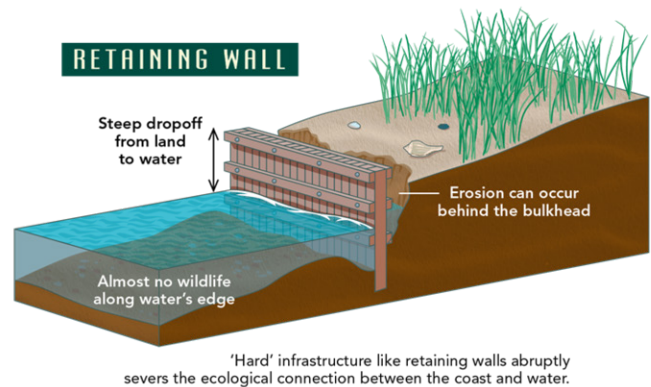
1. Traditional.
2. Hybrid.

Traditional methods utilize only natural materials (logs, and native plants) to stabilize a shoreline. This approach is preferred for quiet areas with little boat traffic and small waves.

Areas exposed to larger waves and winds are best served with a hybrid system that incorporates rock and/or oyster shells with natural materials for additional stabilization.

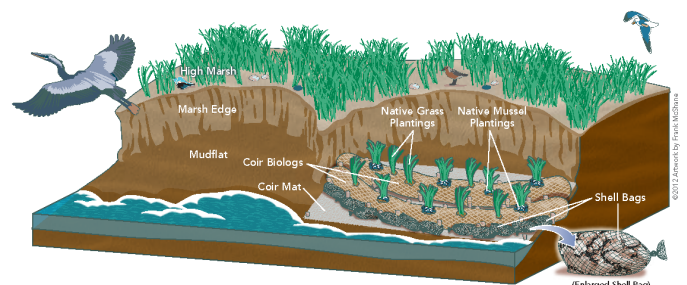
Advantages:

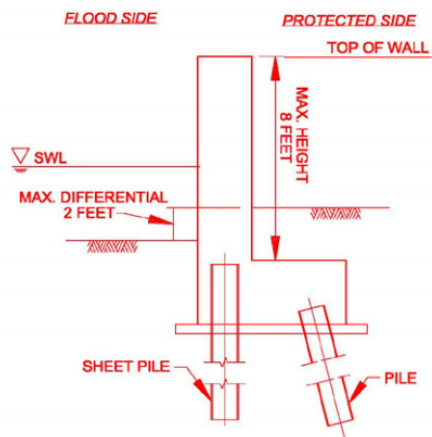
- Tends to cost less than other shoreline stabilization systems.
- Minimal maintenance as living shorelines tend to sustain naturally over time, also help to ensure natural sediment movement along shorelines.
- Improve water quality by filtering pollutants like a living "kidney".
- Trap carbon to help reduce effects of climate change.
- Improve habitat for animals, fish and birds.
- Enhance waterfront aesthetics compared to 'hard' systems.
- The gradual sloping nature of living shorelines help to maintain a plant community that can adapt as sea levels rise.



Disadvantages:

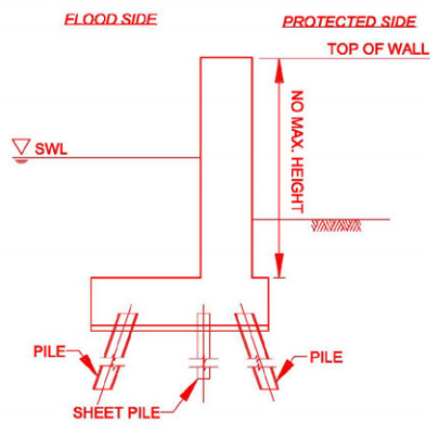
- Limited information available on the effectiveness during tropical storm conditions; therefore other hard non-organic structural approaches might be required.
- Gradual sloping profile, inherent in living shoreline design, would require a large footprint to raise flood line to 9.0' NAVD88.
- The existing conditions along the proposed flood line protection, from the Rayonier Plant to the Port, does not allow for a large footprint due to limits in property ownership, Railroad and Front Street Right-of-Ways, wetland delineation and existing Marine structures.





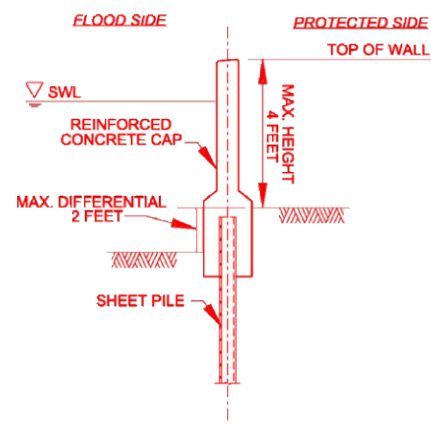
"L"-Wall

Figure 4.1



"T"-Wall

Figure 4.2



"I"-Wall

Figure 4.3

4 "L", "T" and "I"-Wall Configurations

"L", "T" and "I"-Wall (figures 4.1-4.3) configurations are modeled after the "Hurricane and Storm Damage Risk Reduction System Design Guidelines" to provide a comprehensive collection of best practices for hurricane protections by USACE New Orleans District Engineering Division with revisions through June 2012. These walls serve as impact hurricane flood protection, but "T"-Wall system is preferred where there is a potential for boat/barge impact loading. "T"-Walls exhibited the best overall performance during Katrina, being more resilient to over-topping and global instability. All configurations use steel sheet piling to control seepage and provide support.

Advantage:

- One of the preferred designs by the Army Corps of Engineers

Disadvantage:

- Typically the most expensive option
- Requires a large footprint to install
- Installation in front of existing bulkheads would require cofferdams, further disrupting aquatic life, utilities and wood docks, etc.

5 Retaining Walls

For the purposes of this report, Retaining Wall is considered an inland, not waterfront, reinforced concrete wall. Retaining walls would be built along the east-side of Front Street, within the right-of-way and outside required railroad clearances.

As described in the preferred solution (section 1.6), the use of retaining walls could be utilized to provide protection along certain portions of the riverfront to reduce costs and provide necessary protection; however, retaining walls should not be the sole protection measure. Since the retaining wall approach provides protection inland (between Front Street and Railroad), existing riverfront and riverside structures would be left unprotected.

(refer to Appendix B - Drawings, for retaining wall detail)

6 Sheet Piling Seawall

Sources and Images: steelpilinggroup.org

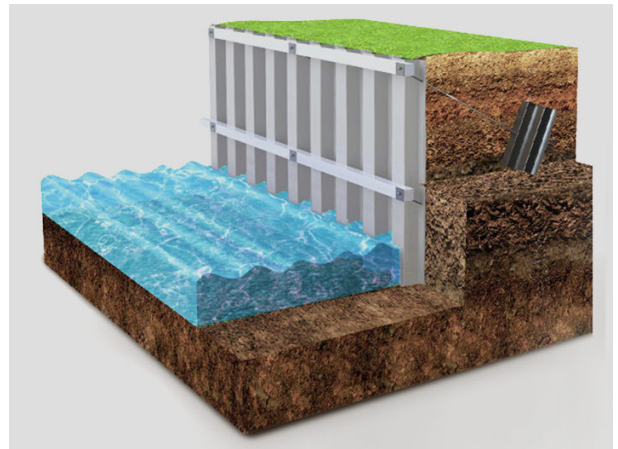
Sheet piles resist soil and water pressures by functioning as a beam spanning vertically between points of support. Sheet piles can help to prevent overtopping, internal seepage, piping of stratum, surface erosion and rodent damage. Basic pile types: Steel, Composite and Vinyl.

Advantages:

- Quick construction compared to reinforced concrete walls.
- Narrow form of construction, which can be installed close to site boundaries, maximizing space.
- Suitable for all soil types.
- No disturbance of existing ground unlike bored concrete pilings.

Disadvantages:

- Increased site disturbances (Noise and Vibration) as compared to other systems.



6b Vinyl Sheet Piles

Vinyl sheet piles offer the same basic advantages in addition to the following:

- UV-Resistant
- Will not corrode
- No toxic coatings or preservatives

Disadvantages:

- Structural limitations compared to Steel and Composite systems

6a Steel Sheet Piles

Steel sheet piles typically come either hot rolled or cold formed. Hot rolled are most common with cold formed primarily used for smaller applications. Advantages are similar to the general advantages listed above.

Disadvantages:

- Eventually corrodes (rust)
- Can be coated with toxic chemicals



**Above corroded steel sheet pile*

6c Composite Sheet Piling Seawall

Composite sheet pilings consist of a special marine-grade resin system that locks in thousands of interwoven rovings and mattings to produce a sheet piling that can withstand the harshest marine environments. Composite sheet piling achieves taller wall heights than vinyl sheet piling, even rivaling those designed and constructed with steel.

The composite sheet pile system could be used throughout the proposed flood line protection in lieu of the retaining wall system including the "I"-Wall and "T"-Wall configurations.

Composite sheet piles offer the same basic advantages in addition to the following:

- UV-Resistant
- Will not corrode
- No toxic coatings or preservatives

Disadvantages:

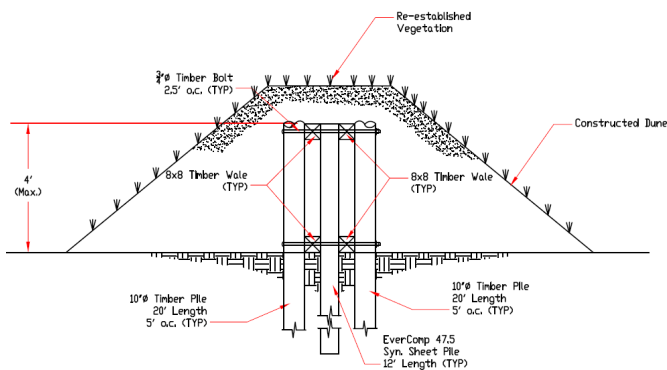
- Structural limitations compared to steel

7 Dune/Berm Systems

Dunes are dynamic structures that are inherently effective at minimizing damage during very large storm events. These systems naturally erode during and recover after severe storm events. Though natural dunes perform well, human modifications strive to enhance the natural features (of dunes) by adding structural components. The following alternatives reflect two basic human modification strategies to enhance dune systems.

7a Earthen Berm (Core Wall)

Source: njseagrant.org



This system is typically utilized to stabilize dunes by incorporating a non-erodible core. The system would generally be landward, not typically exposed to hydro-forces; however, in a storm event would provide necessary flood protection. As part of the masterplan, this approach would be paired with existing living shorelines to combat typical daily forces.

The system would typically be constructed utilizing sheet pilings (at the center) with wale beams and piles on each side of the sheet pile. Refer to image, above.

Advantages:

- Maintains natural environment and appearance.
- Utilizes natural materials to stabilize earth over inner stabilization structure.
- Durable with longevity.
- Suitable for all soil types.

Disadvantages:

- Larger footprint compared to other systems
- Dune/berms must be properly maintained, if not maintained the structural core could accelerate erosion.
- Cost to construct.

7b Earthen Berm (with Revetment Mat)

Sources and Images: landshore.com



This system, also called Articulated Concrete Mats or Flexamat, is used to improve shoreline stability. The system comes in two basic forms: Open-Cell or Closed-Cell.

Open-Cell: Blocks are open to allow vegetation to cover blocks over time. Generally used above design or natural water levels.

Closed-Cell: Heavier than open-cell blocks, the closed-cell blocks are deployed in heavily eroded areas and prone to high volumes of water. Channels and culverts are good examples. Generally used in submerged, below the water level applications.

Advantages:

- Cost effective.
- Maintains natural environment and appearance.
- Utilizes natural materials to stabilize earth over inner stabilization structure.
- Durable with longevity.
- Suitable for all soil types.
- Less maintenance compared to "core walls".

Disadvantages:

- Larger footprint compared to other systems



**Above proposed resiliency protection plan reflecting segments of resiliency masterplan*

1.6 PREFERRED SOLUTION

The preferred solution is based on finding the most economical and feasible mitigation methodology to reduce property damage, business interruption/losses, environmental and historical site damage as a result of rising waters (flooding) and natural disasters. Most importantly the solution must protect against social losses such as death, injury and mitigating impact on first responders, which can be easily overwhelmed in the wake of natural disasters.

The recommendation of the engineering / resiliency study is phased construction approach (identifying 9 potential phases) for responsive mitigation and improvements to the City's waterfront along the Amelia River consisting of living shorelines, new (enhanced) raised bulkheads, improved storm-water systems (with flood protection) and upgrades to boat launch ramp, for a 1.1 mile section, along front street, including the City's historic district. All protection measures are provided to an elevation of +9.0' NAVD 88 to reduce long-term risk to people and property from rising waters and natural disasters. The following provides a brief description of the protection methodologies for each segment.

- 1** STA 09+90 to STA 17+21
 Segment 1, as reflected on Drawing Sheet 2.1, provides protection through use of a retaining wall (or possible berm) along the east side of S. Front Street. This approach accommodates a possible future turn-around to remediate potential deadend. (note: sheet 2 reflects a similar approach minus planned future turn-around)
- 2** STA 17+21 to STA 27+37
 Segment 2, the retaining wall system continues (sheet 2.1), stopping at S. Front Street, where a hydro-defense plank system is utilized to provide protection at the road crossing. This system will remain open, only being closed in preparation of a major storm event. At the west side of S. Front Street, the retaining wall picks back up until it terminates at a trash receptacles. The system then transitions to an earthen berm (with revetment mat) that ties into existing living shorelines (sheet 3.1) at Parking Lots C and D. The last piece of this segment, consists of a composite bulkhead system. (note that this segment is discussed in further detail in Section 3)
- 3** STA 27+37 to STA 27+87
 Segment 3, Boat Launch Ramp (sheet 3.1), consists of several repairs/enhancements while maintaining the existing boat launch ramp elevation and slope. Repairs generally consist of new "I-Wall" at each side of opening with Hydro-defense plank system to protect the actual ramp opening. In addition, new composite bulkhead is proposed in-front of the existing bulkhead.

- | | | |
|----------|------------------------|---|
| 4 | STA 27+87 to STA 30+87 | Segment 4, between boat launch ramp and Brett's Restaurant Structure (sheet 3.1), generally consists of a new concrete secant pile system in front of existing bulkhead to Parking Lot B. The secant pile wall is proposed to continue above existing grade and future landward boardwalk. Access to existing docks will be maintained through use of hydro-defense plank system. |
| 5 | STA 30+87 to STA 31+72 | Segment 5, Brett's Waterway Cafe, is not currently included in this analysis, but will be included in a future report. |
| 6 | STA 31+72 to STA 35+40 | Segment 6, is similar to Segment 4, consisting of a new concrete secant pile system in front of existing bulkheads to Parking Lot A. Access to existing board walk will be maintained through use of hydro-defense plank systems. |
| 7 | STA 35+40 to STA 39+15 | Segment 7 (sheet 4) generally consists of either bulkhead or living shoreline enhancements protecting to 7.0' NAVD88. A new "I-Wall" retaining wall with sheet pile is provided at the flood protection line to bring protection to 9.0' NAVD 88 from Parking Lot A to City Property at 101 N. Front Street. |
| 8 | STA 39+15 to STA 45+25 | Segment 8 (sheets 4 and 5), begins with a hydro-defense plank system providing opening at 101 N. Front Street. Along the east side of N. Front Street, a retaining wall similar to Segment 1, is utilized to provide flood protection. |
| 9 | STA 45+25 to STA 52+52 | Segment 9 (sheet 5) is a continuation of Segment 8, retaining wall protection system between Front Street and the Railroad tracks, ending just before Dade Street and the Port of Fernandina. At Dade Street proposed minor road modifications increase road elevation to match required flood protection elevation. This allows access to/from N. Front Street after hydro-defense systems are in place. |

The proposed preferred shoreline protection plan (above) would increase the city's resilience to major storm events and protect the City's well-preserved historic buildings. Proposed living shorelines, revitalize ecosystem preserving natural resources, non-natural barriers, and modeled after designs provided by the U.S. Army Corps of Engineers (USACE). The riverfront shoreline protection design concepts are based on USACE Hurricane and Storm Damage Risk Reduction System Design Guidelines. These "Design Guidelines" present methods and criteria that shall be used by engineers in the design of hurricane system components and is based on Hurricanes Katrina and Rita that caused tremendous loss of life and destruction of property when they struck coastal Louisiana in 2005.

1.7 COST SUMMARY

The established 1.1 mile flood protection line that makes up the shoreline protection plan is divided into nine logical phased solutions based on existing conditions, site location, property ownership and flood protection methodology types. The riverfront improvements could be completed in phases with a probable total cost of \$16 - \$19 million.
(Refer to Appendix A - Opinion of Probable Costs)

1.8 AREAS FOR FURTHER STUDY

The preferred solution is based on preliminary information gathered for this study. Each segment will require further review, development and permitting to finalize design. Also refer to Section 3 for further study and development at segment 2.



Project Update

AMELIA RIVERFRONT STUDY



September 15, 2020



Today's Topics



Study Refresher



Benefits of Resiliency



Updated Plan Components



Revised Site Plans



Phase 1-a (add RR Crossings)



Phase 2 (lots C and D)

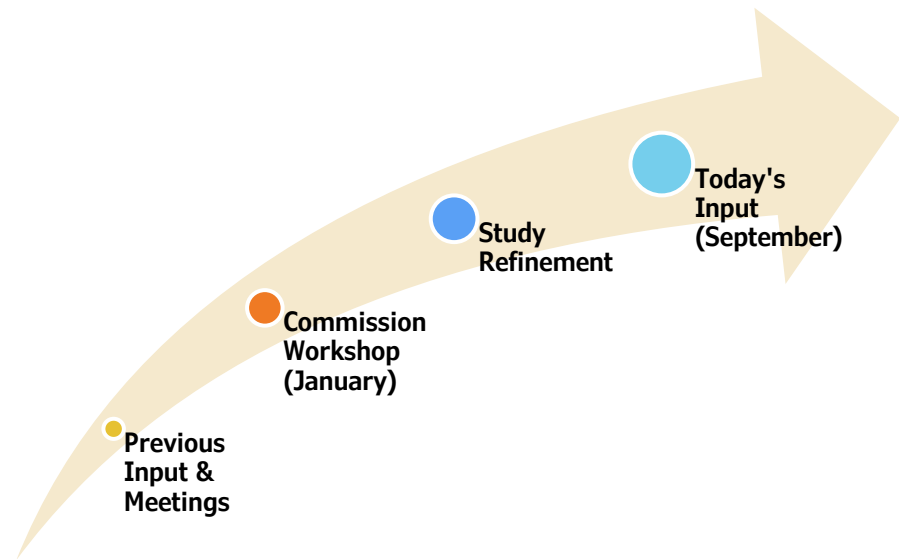


Phase 3 (Brett's Area)



Q & A (Input to Study)

Study Progress



Implementation Costs (Update)

**\$20 - 25+ Million
(January 2020)**



**\$16 - \$19 Million
(September 2020)**

Benefits of Resiliency

1

Limit/reduce flooding impact, damage, cost

Benefits of Resiliency

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE MANUAL

APRIL 2020

2

Reduced Insurance Premiums

Benefits of Resiliency (Living Shorelines)



One square mile of salt marsh stores the carbon equivalent of **76,000 gal of gas** annually.



Marshes trap sediments from tidal waters, allowing them to **grow in elevation** as sea level rises.



Living shorelines improve **water quality**, provide fisheries **habitat**, increase **biodiversity**, and promote **recreation**.



Marshes and oyster reefs act as natural **barriers** to waves. **15 ft** of marsh can **absorb 50%** of incoming wave energy.



Living shorelines are **more resilient** against storms than bulkheads.



33% of shorelines in the U.S. will be **hardened** by **2100**, decreasing fisheries habitat and biodiversity.



Hard shoreline structures like **bulkheads** prevent natural marsh migration and may create seaward **erosion**.

3

Improve Ecological Function, Reduce Erosion & Sedimentation

Updates to Plan

► Preferred Resiliency (Protection) Systems:

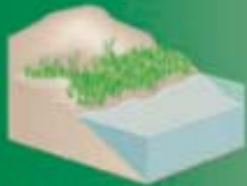
- 1 Retaining walls
- 2 Living shorelines
- 3 Composite bulkheads
- 4 Secant pile walls
- 5 Earthen berms (with stabilization)
- 6 Hydro-defense plank / flood protection systems
- 7 Oyster Bag/Mat

Living Shoreline - Enhancements

GREEN - SOFTER TECHNIQUES

GRAY - HARDER TECHNIQUES

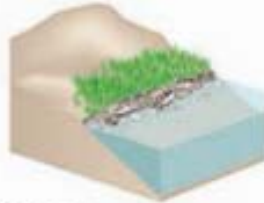
Living Shorelines



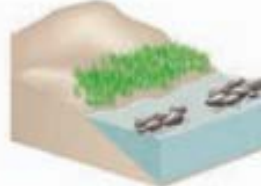
VEGETATION ONLY -
Provides a buffer to upland areas and breaks small waves. Suitable for low wave energy environments.



EDGING -
Added structure holds the toe of existing or vegetated slope in place. Suitable for most areas except high wave energy environments.



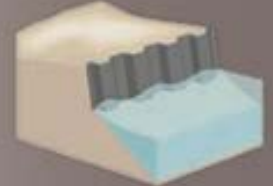
SILLS -
Parallel to vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.



BREAKWATER -
(vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.

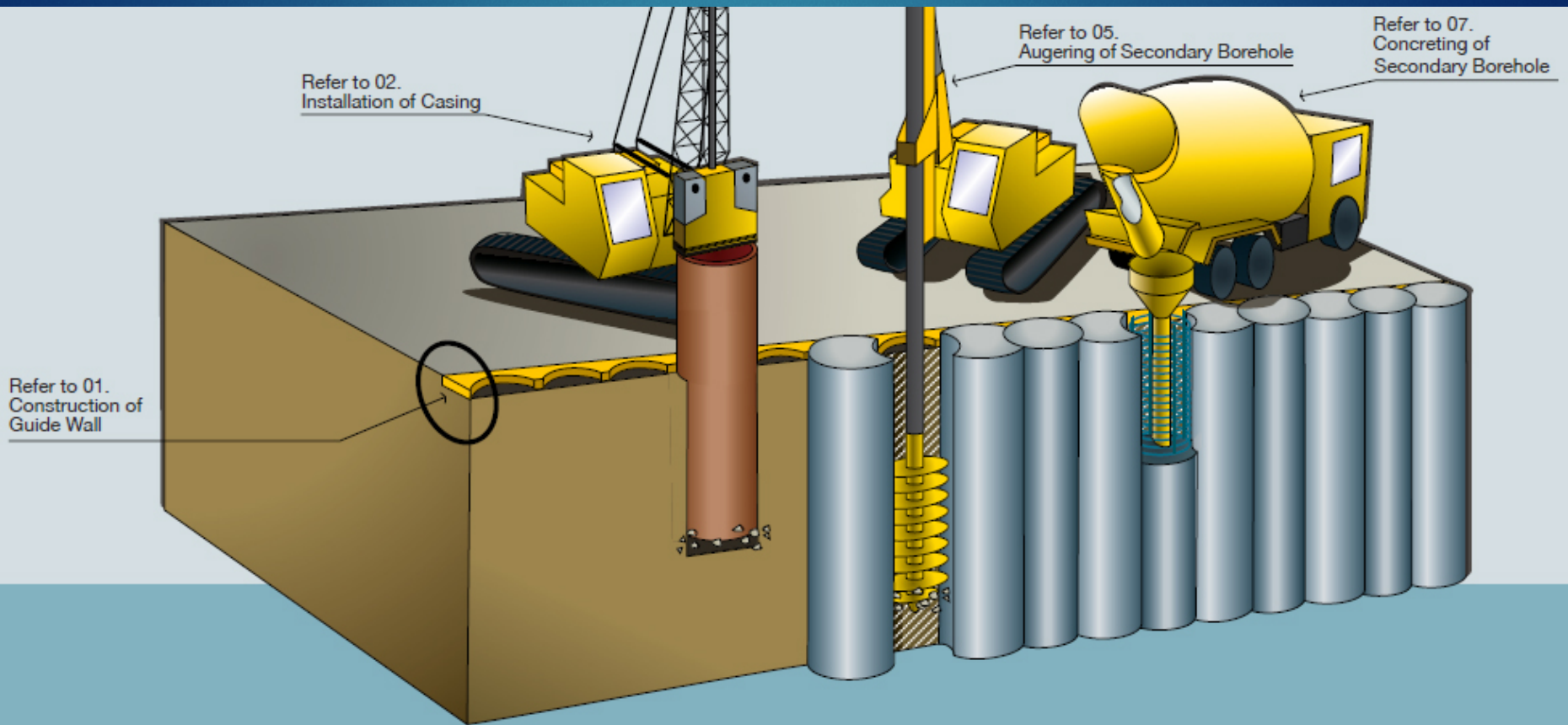


REVETMENT -
Lays over the slope of the shoreline and protects it from erosion and waves. Suitable for sites with existing hardened shoreline structures.



BULKHEAD -
Vertical wall parallel to the shoreline intended to hold soil in place. Suitable for high energy settings and sites with existing hard shoreline structures.

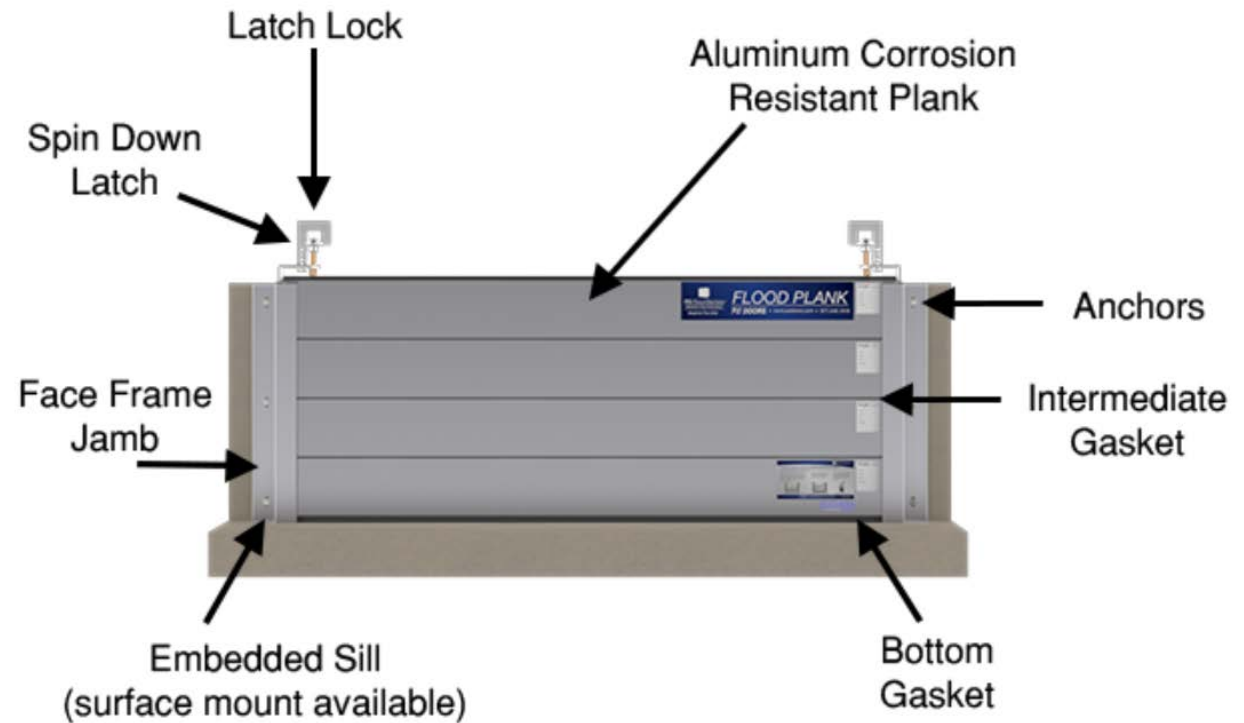
Secant Pile Walls



Hydro-defense Flood Plank



HYDRODEFENSE® FLOOD PLANK™ QUICK FACTS



Oyster Bag / Mat



Updates to Plan

- ▶ Preferred Resiliency (Protection) Systems
- ▶ Set stabilization goal to 9.0' NAVD.
- ▶ Probable Cost: \$16-19 million

Resiliency Masterplan

(Key Plan, Segments 1-9)

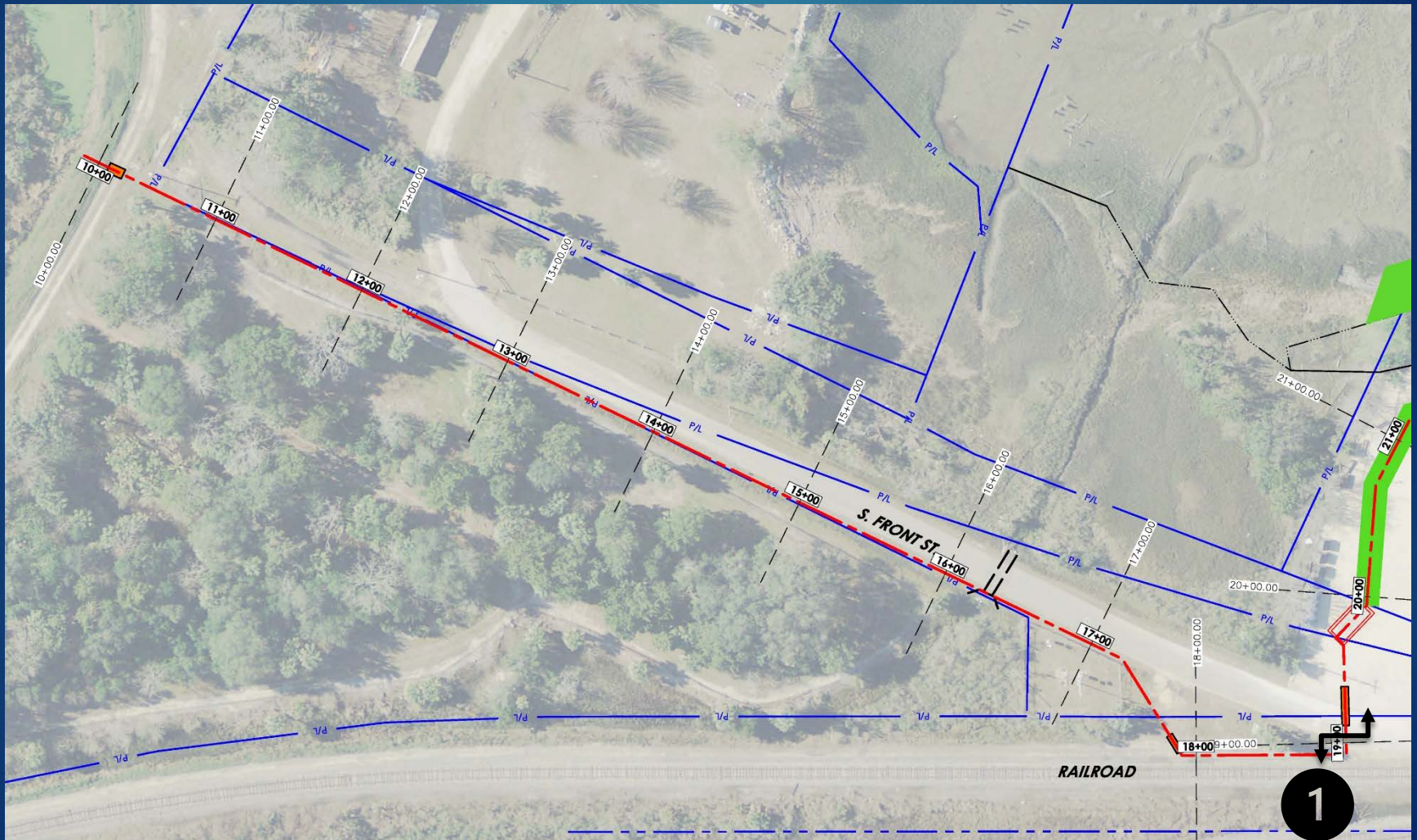


Segment 1 Rayonier-Lot D

- ▶ Retaining wall (or berm) along eastside of S. Front Street
- ▶ Hydro-defense plank system at roadway

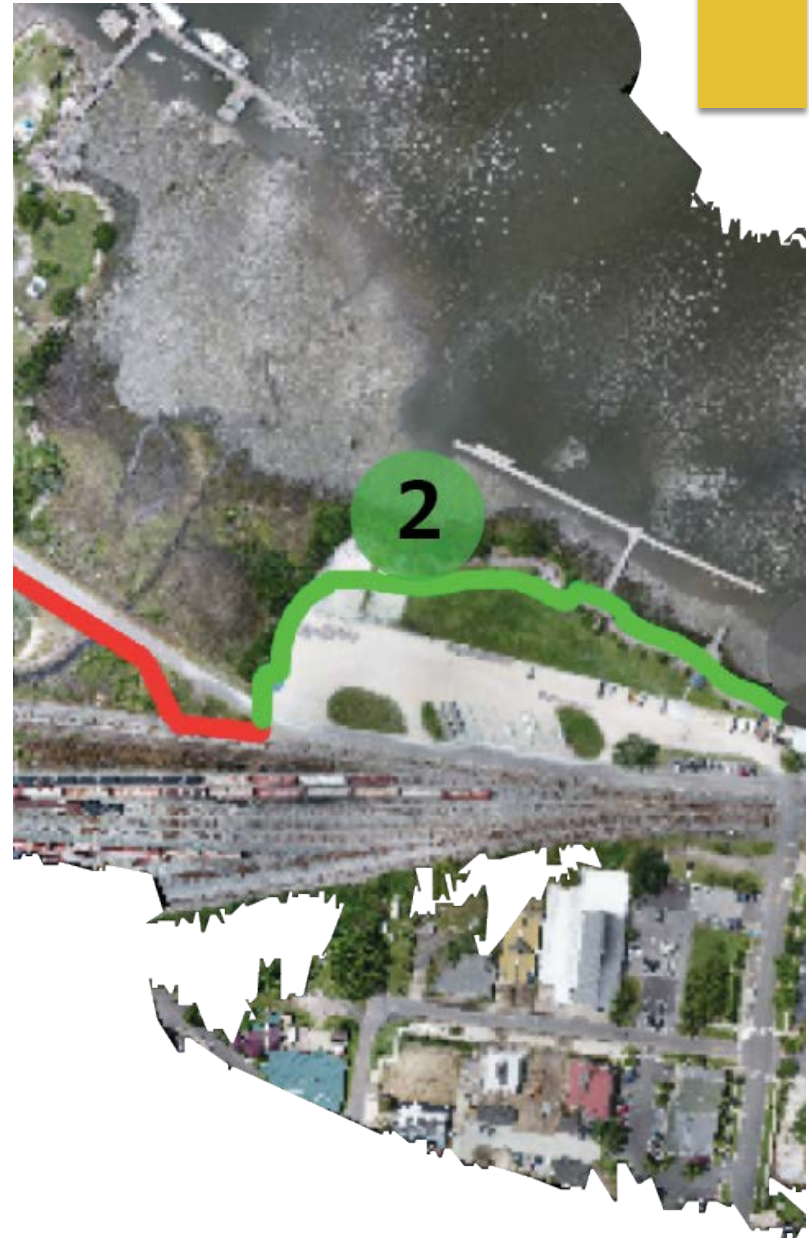


Segment 1 (Rayonier – Lot D)

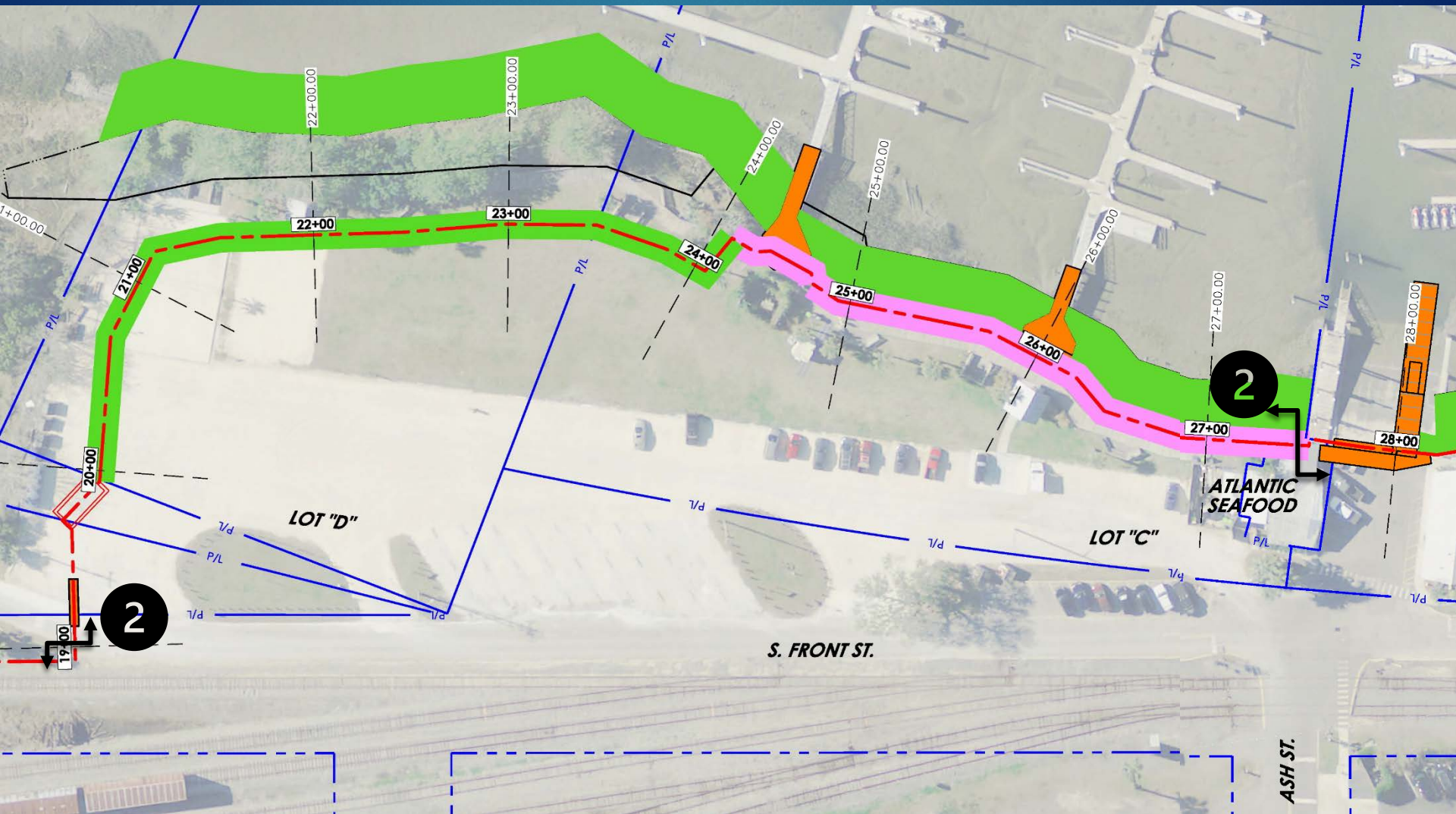


Segment 2 Lots C & D

- ▶ Retaining wall
- ▶ Earthen berm, elevated walkway, enhanced living shoreline
- ▶ Composite Bulkhead (small section to boat ramp)



Segment 2 (Lots C & D)



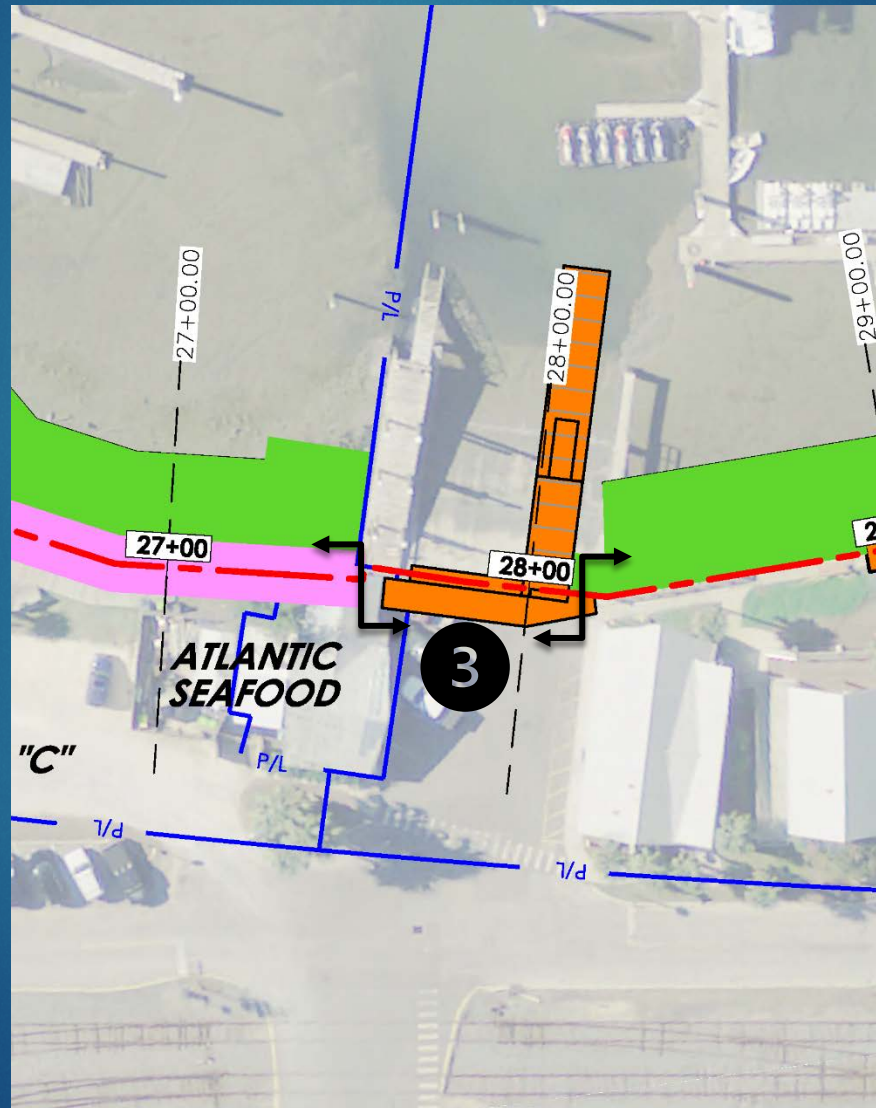
Segment 3

Boat Ramp

- ▶ “I-Wall” each side of boat ramp
- ▶ Hydro-defense plank system at ramp opening (for major storm events)



Segment 3 (Boat Ramp)



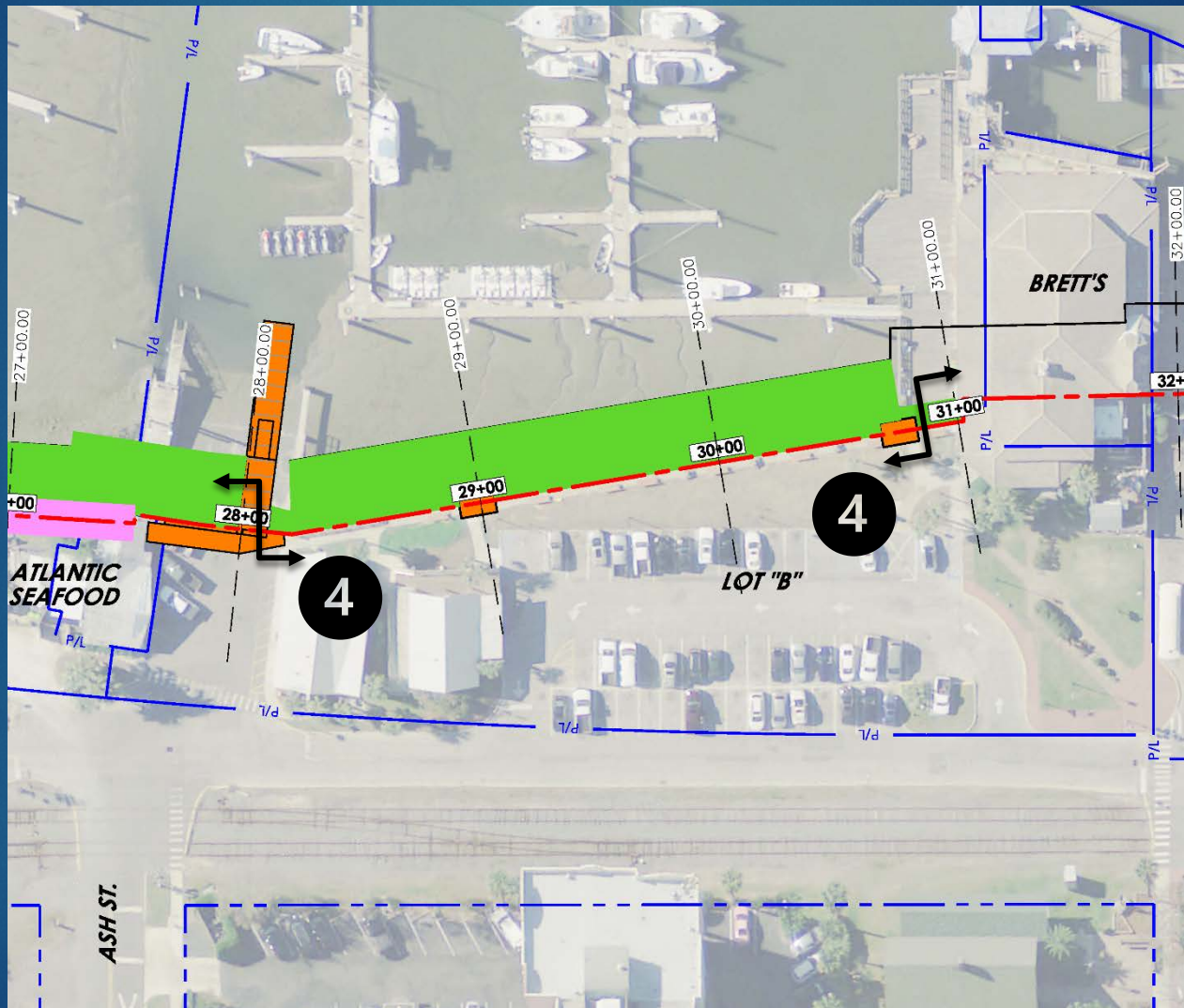
Segment 4

Bulkhead – Lot B

- ▶ Secant pile walls
- ▶ Timber walkways and riverfront seating (optional)



Segment 4 (Bulkhead Lot B)



Segment 5 – Brett's Area

(Add'l Task, In Progress, 3 Components)

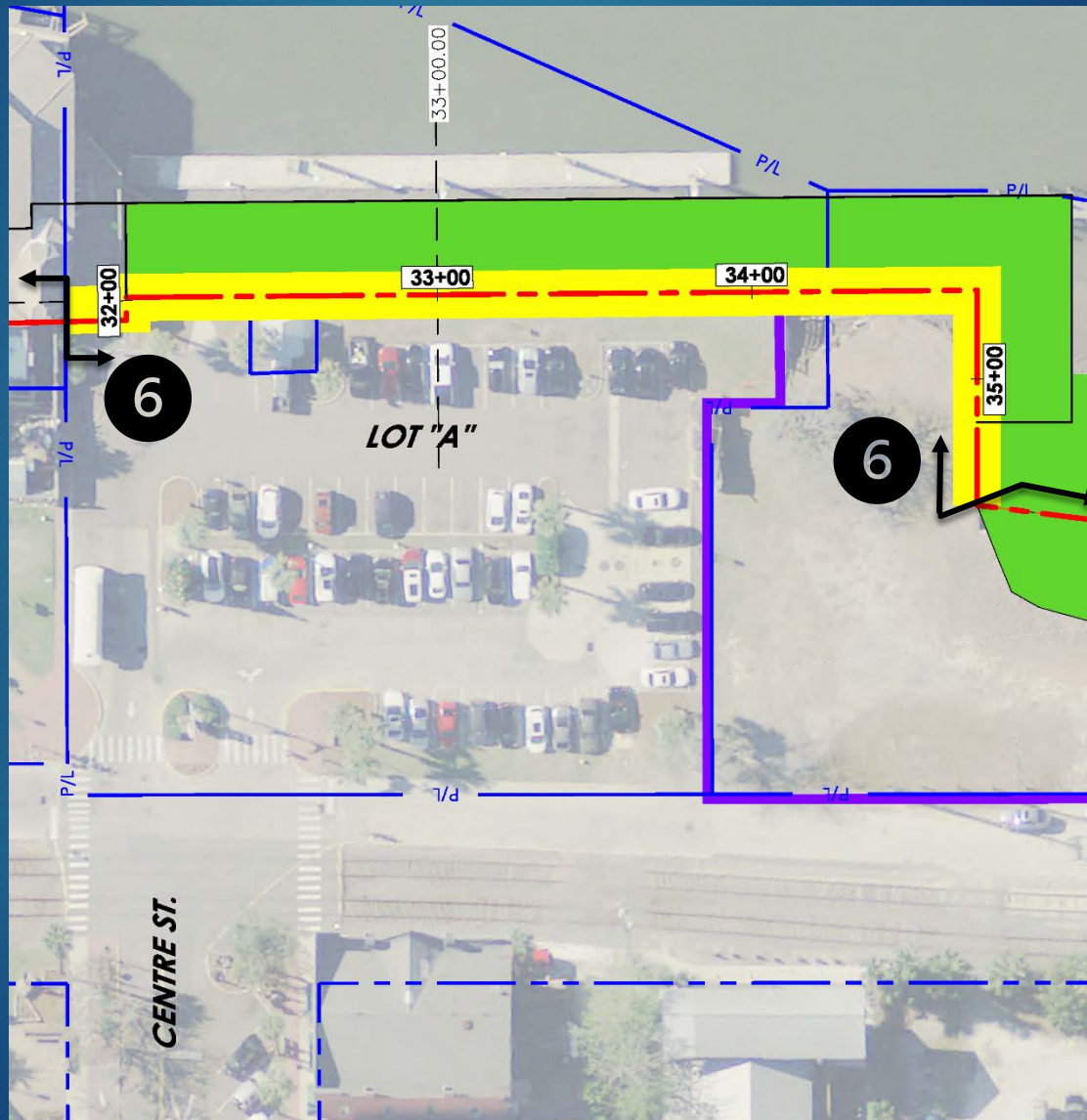


Segment 6 Bulkhead - Lot A

- ▶ Secant pile walls
- ▶ Timber walkways and riverfront seating (optional)



Segment 6 – Bulkhead Lot A



Segment 7

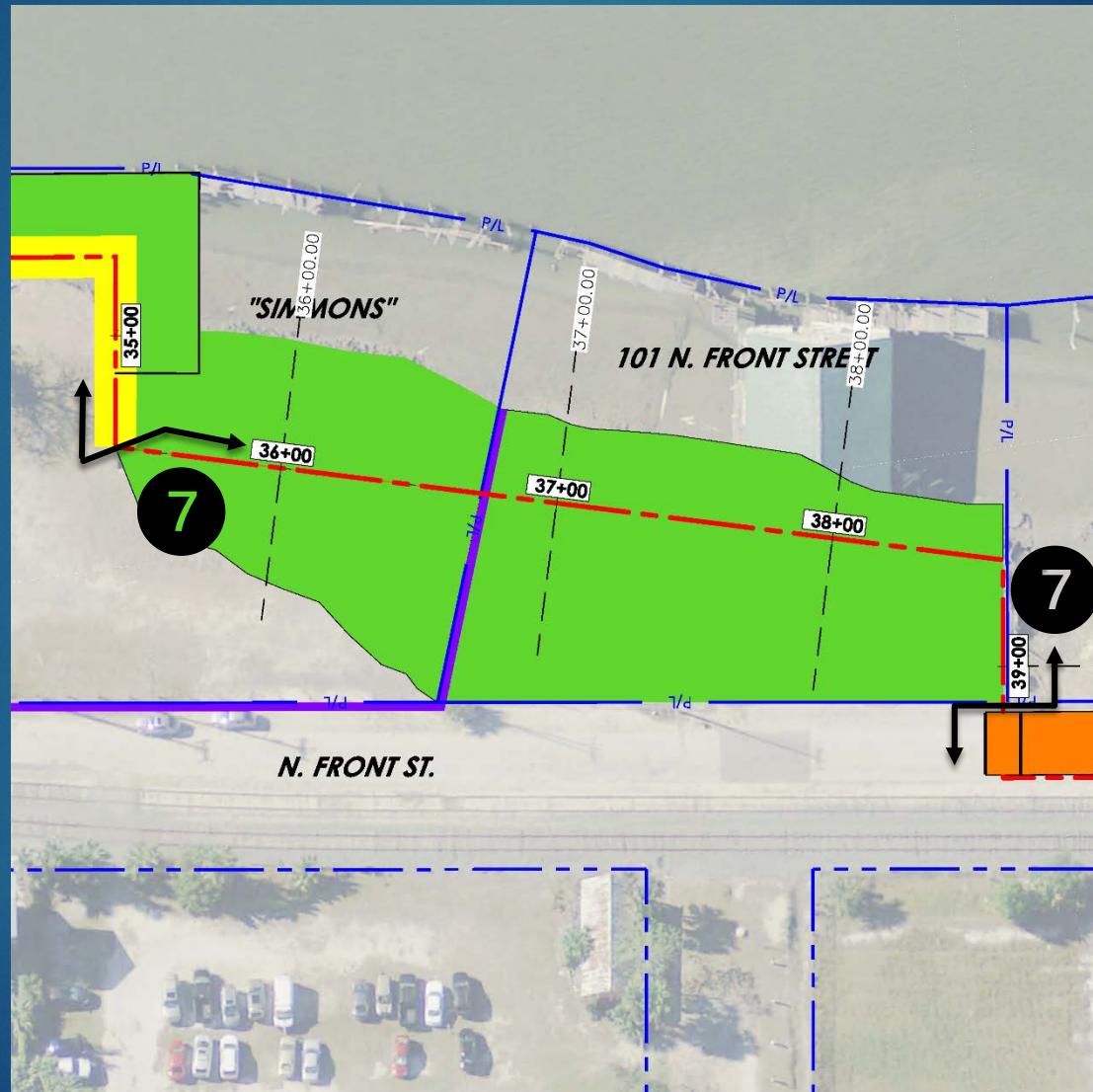
Bulkhead, Shoreline (Lot A to 101 N. Front St.)

- ▶ Enhancement to existing living shorelines
- ▶ “I-Wall” (or bulkhead) landside of living shorelines



Segment 7

Bulkhead, Shoreline (Lot A to 101 N. Front St.)



Segments 8 & 9

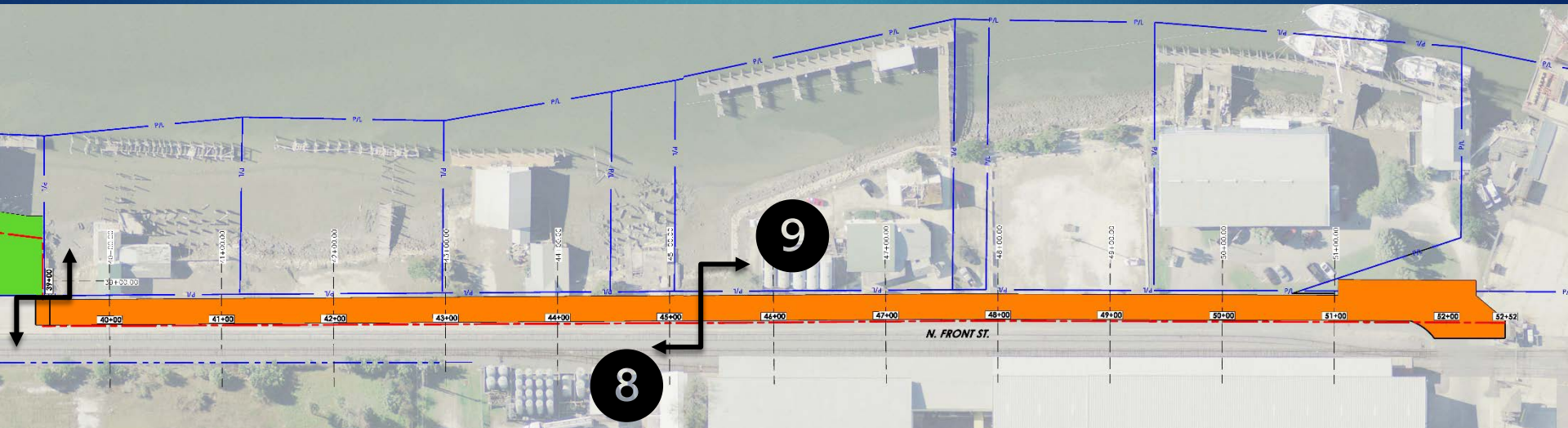
(101 N. Front St. - Port of FB)

- ▶ Hydro-defense plank system
- ▶ Retaining wall along East-Side of Front Street
- ▶ Overhead Utilities, move below ground



Segment 8 & 9

101 N. Front St. - Port of FB



Phase 1a (railroad)

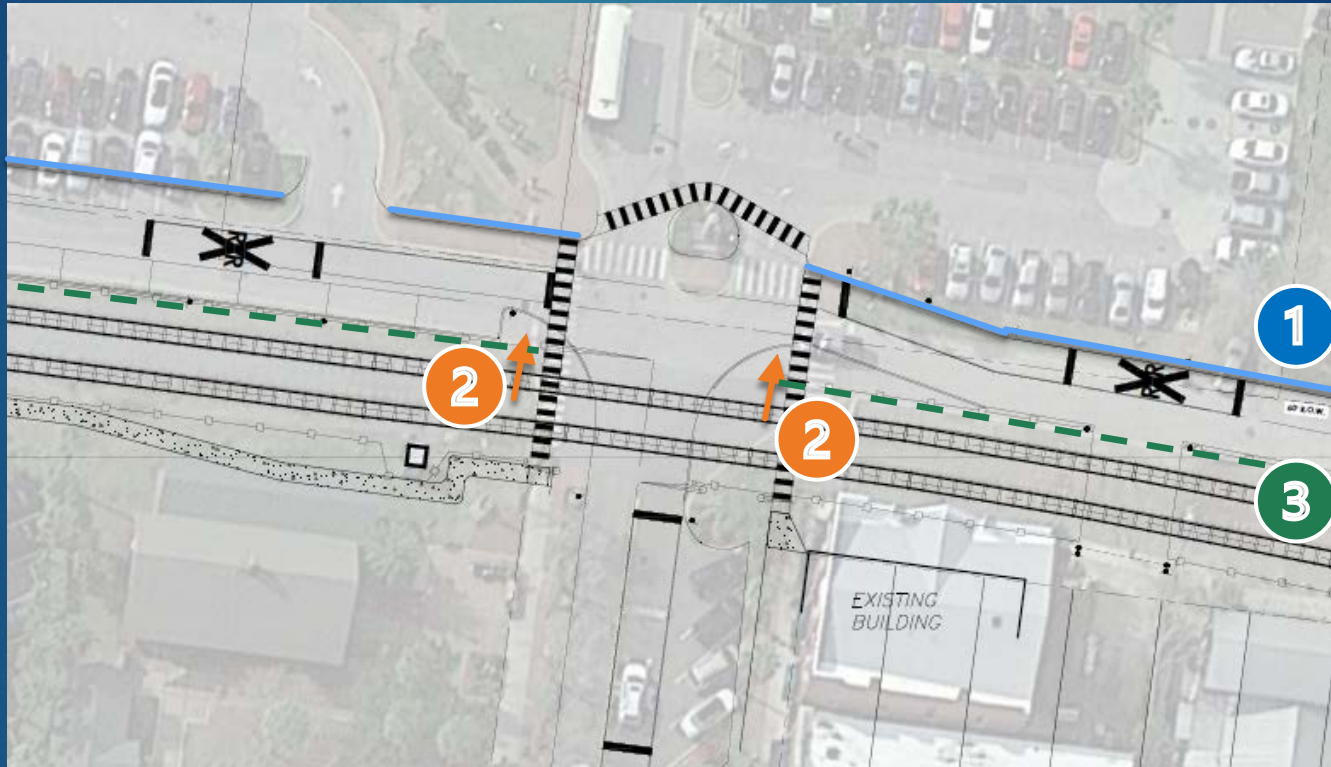
- ▶ Limited space at all 3 existing intersections, impacting resiliency and functional use.
- ▶ Minor relocation of Front Street at existing intersections (Ash, Alachua and Centre).
- ▶ Railroad is a static structure (no intention to change elevation or location) with the outermost points along Front Street, at 9.0' NAVD.

Alachua Street



1. Pinch point at Front St./city land/river/pvt land.
2. Shift Front Street to accommodate RR clearances
3. Addition of fence and retaining wall

Centre Street



1. Pinch point at existing parking lots/roadway
2. Shift Front Street to accommodate RR clearances
3. Addition of fence

Ash Street



1. Pinch point at transformer/roadway/access to boat ramp and Lot C&D
2. Shift Front Street to accommodate RR clearances
3. Addition of fence

Study Phase 2 (Lots C&D, Design & Permitting)

- ▶ Preliminary Design and Permitting for Lots C & D.
- ▶ Preferred Solution:
 - Retaining wall and composite bulkhead (small section)
 - Elevated walkway and enhanced shoreline.
- ▶ Living Shoreline and Bulkhead Permits Needed
- ▶ Probable Cost for Phase 2 (segment 2): \$2-3 million

Study Phase 3 (Brett's Area)

- ▶ Study tasks underway, not complete
- ▶ Review and recommendations:
 - 1 - Bulkhead (beneath)
 - 2 - Building Condition (Brett's Restaurant Bldg.)
 - 3 - Marine Substructure / Pier
 - Contractor Repair Estimates (underway)



Questions

Guidance &

Input



.....

Resiliency Master Plan
City of Fernandina Beach
August 2019

.....

*Prepared By: Wood E&I Solutions, Inc.
6256 Greenland Road
Jacksonville, Florida 32258*



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Appendix B: Downtown Waterfront Flooding Assessment
Appendix C: Downtown Waterfront Sea-level Rise Study
Appendix D: Adaptation Strategies Summary Sheets
Appendix E: Resilience Scorecard Project Evaluation Criteria

INTRODUCTION

For Florida's coastal communities, resilience is the ability to recover quickly from disasters and to adapt to future conditions such as sea-level rise. This *Resiliency Master Plan* will serve as a guidance document to promote increased resilience in all facets of operation of the City of Fernandina Beach. To follow the ever-expanding resiliency efforts of agencies, including the FDEP Office Resilience and Coastal Protection, this document shall be updated as necessary to reflect the most current information and recommendations available.

Severe weather and sea-level rise pose significant threats, with a trend towards more frequent and intense rainfall events and an increase in the rate of sea-level change. These challenges require a comprehensive, incremental approach to adaptation. Resiliency does not represent an end goal, but a consistent, sustained effort to adapt to a changing environment.

The City of Fernandina Beach wishes to produce a *Resiliency Master Plan* document (the Plan) that enables the City to effectively plan future infrastructure investments to ensure the preservation of our community from the effects of rising sea-levels and flooding. The City will develop this Plan in phases, starting with some of the most vulnerable areas.

To help achieve this vision, the City has formed a resiliency steering committee with representatives from several City departments, including Stormwater, Planning & Conservation, Building, Grants, and the Airport. The committee provided input from perspective of each department on the scorecard development, and feedback on the inventory of project co-benefit impacts.

PHASE 1 – DOWNTOWN WATERFRONT

The downtown waterfront of historic Fernandina Beach poses unique challenges with respect to resiliency. Balancing a working waterfront and historic preservation require specific strategies which have been explored in this section. A priority has been placed on this area by the Fernandina Beach City Commission to address flood protection, shoreline stabilization, and drainage issues in order to facilitate redevelopment of the waterfront and minimize the vulnerability of the downtown central business district.

As a first step in addressing resiliency, the City applied for funding to develop the *Downtown Waterfront Resiliency Master Plan*. The purpose of this plan is to provide data, analysis, and recommendations to enable Fernandina Beach to systematically understand and prepare for the impacts of existing and future downtown flooding which results from high-tide events, storm surge, flash floods, and sea-level rise combined with stormwater runoff and subsidence hazards.

Why the Downtown Waterfront Area?

As it has been since the 19th century, the City of Fernandina Beach is working hard to be a beautiful place to visit and live in the years to come. Stabilizing the riverfront shoreline to protect our historical, natural, cultural, and economic resources is a key component toward that goal. In 2016, Hurricane Matthew significantly damaged the City's marina and the related storm surge inundated several downtown blocks and buildings. While Hurricane Irma's effect a year later was less significant, both storms re-confirmed concerns detailed in previous reports to City officials: but for the grace of an eastward shift by Hurricane Matthew and a westward shift by Hurricane Irma, downtown Fernandina Beach would have suffered greatly, likely including the hundreds of historic structures located within blocks of the Fernandina Harbor Marina. As the report *Vulnerability Assessment: City of Fernandina Beach* discusses, "Flooding and storm surge still present a very significant threat to the City and its assets." There are challenges Fernandina Beach must be prepared to face associated with specific natural disasters (such as hurricanes) and long-term environmental trends (tidal surges and sea-level rise). The near-misses of recent storms have raised the awareness and urgency that the City must prepare for and seek resiliency and mitigation options to address the unrelenting power of water.

In Nassau County's Local Mitigation Strategy (LMS), an evaluation and planning document specific to addressing strategies to mitigate Sea-level Rise in waterfront areas remains the #1, yet unfunded, project. The City of Fernandina Beach has an array of disparate resilience planning documents that require integration and inclusion of additional data to serve for comprehensive planning. This document brings together a summary of information from those plans, along with additional data and analysis, to create a comprehensive plan that builds upon various local resilience documents, integrates current coastal water and weather projections, and provides recommendations for improvements that will meet the stormwater and coastal challenges of the decades ahead.

I. BACKGROUND

A. Project Area

The *Downtown Waterfront Resiliency Master Plan* is Phase 1 of the City's efforts to plan for, mitigate, and adapt to the effects of rising sea levels and flooding. The Downtown Waterfront Project Area encompassed within this phase includes the entirety of Front Street between the Port of Fernandina and the Rayonier Advanced Materials Mill. It extends west into the Amelia River to incorporate the marina docks and east to Third Street. The area also consists of parcels to the north along Third to Dade and Escambia Streets, and south to Cedar Street. Figure 1 illustrates the extent of the described Downtown Waterfront Project Area.



Figure 1: Project Area Map

B. Data Review

In the development of the *Downtown Waterfront Resiliency Master Plan*, existing infrastructure and planned improvements were evaluated as well as studies and conceptual plans. On the following page is a timeline of the different project plans and assessments that were considered during the development of the *Downtown Waterfront Resiliency Master Plan*.

Project Plans	Issue Date
Fernandina Beach Front Street Improvements Conceptual Plans	September 19, 2008
Amelia Riverfront Engineering Study and Waterfront Concept	July 2019
City of Fernandina Beach 90% Alachua Street Roadway Improvements	March 23, 2012
City of Fernandina Beach 60% Front Street Roadway Improvements	November 2012
Downtown Riverfront Park: Lot B 60% Plans	December 18, 2015
COFB Waterfront Flood Protection Project Presentation	August 2018
Fernandina Beach Waterfront Master Plan Schematic Site Plans	March 2009

Assessments	Completion Date
Waterfront CRA Master Plan Traffic Circulation and Parking Study	March 20, 2009
City of Fernandina Beach 2016 Stormwater Master Plan Update	December 2016
Vulnerability Assessment – City of Fernandina Beach	March 23, 2017
Fernandina Harbor Marina Seawall Assessment	October 22, 2018
City of Fernandina Beach Downtown Waterfront Flooding Assessment	August 5, 2019
City of Fernandina Beach Downtown Waterfront Sea-level Rise Study	January 9, 2019
Area 5 Downtown Drainage Improvements – Preliminary Engineering Report	May 16, 2019

C. Key Assets

A key asset is defined as a critical service, structure, or feature to the City. This plan highlights several key assets that are important to the City of Fernandina Beach. They include core infrastructures such as the electrical grid and the City stormwater, water, and sewer systems. The City of Fernandina Beach provides stormwater collection, drinking water distribution, and wastewater collection services within the Downtown Waterfront Project Area. The establishment of the railroad running from Fernandina to Cedar Key brought development to the waterfront area in the late 19th and early 20th century. Today, these buildings make up the Downtown

Historic District, and the rail lines allow core industries to move product in and out of their facilities. These historic buildings and the railroad itself are all key assets related to this plan. The Fernandina Harbor Marina is an example of a key asset that has already been impacted by a severe storm event. The marina was closed for repairs in November 2018 due to damages caused by Hurricane Matthew. The repairs include strategies to improve the resiliency of this asset and are discussed in more detail under the *Stakeholder Feedback* section.

D. Stakeholders

One of the fundamental elements in developing this *Downtown Waterfront Resiliency Master Plan* was community involvement. This was accomplished through direct engagement with key stakeholders and community groups, as well as a public workshop with a presentation on the City's approach to resiliency. The City reached out directly to some stakeholders, including utilities and affected industry. Attempts were made to reach additional stakeholders, including downtown property owners, through coordination with Fernandina Beach Main Street. The goals of this stakeholder engagement were to identify the critical assets in the Downtown Waterfront Project Area and how they will be affected by shocks and stresses.

Identified Stakeholders

- *City of Fernandina Beach*
- *Downtown Waterfront Property and Business Owners*
- *Fernandina Beach Main Street*
- *Residents of Fernandina Beach*
- *Fernandina Harbor Marina*
- *Nassau County*
- *Florida Public Utilities (FPU)*
- *City of Fernandina Beach Utilities*
- *Florida Department of Transportation (FDOT)*
- *US Army Corps of Engineers (USACE)*
- *Port of Fernandina*
- *Westrock Mill*
- *Rayonier Advanced Materials Mill*
- *Railroads (CSX, First Coast Railroad, and Genesee & Wyoming)*

i. Stakeholder Feedback

Through this stakeholder engagement, the City of Fernandina Beach received feedback focused on three themes: protection of assets, continuity of service, and mobility. FPU and City of Fernandina Utilities offered information on their respective systems and some plans or opportunities to protect their assets. FPU provided a system map of the waterfront area which identified aboveground and below ground feeder and service lines. FPU is currently working on a plan to underground portions of the overhead lines and switch to ground-mounted transformers along Front Street, at the request of one of the City Commissioners. The City of Fernandina Beach Utilities has one lift station within the Downtown Waterfront Project Area, which serves 330 properties. The lift station is currently equipped with a propane backup generator located six

inches above base flood elevation (BFE). The only opportunity that has been identified to date to improve the resiliency of this lift station would be raising the elevation of the wet well vent above BFE to reduce the risk of water entering the system through the wet well during a potential flood event.

Stakeholders linked to industry in the area were focused on continuity of service and mobility. For example, Westrock Mill commented on the importance of maintaining the operation of the railroads and how they have adapted to manage short and medium railroad outages by stockpiling finished product. The Port of Fernandina's input for waterfront planning is to consider pedestrian and vehicle safety along the railroads.

The Fernandina Harbor Marina, which sustained heavy damage during Hurricane Matthew, is currently being repaired. The Marina highlighted the replacement of the 30-year-old wave attenuator which acts as a wave energy dissipater, raising the electrical system and HVAC above BFE, and utilization of flood-resistant materials. Also, the new piles for the new docks are being placed 4 feet higher than pre-Matthew to provide an additional level of protection from the docks being dislocated. Beyond the completion of these repairs, no additional upgrades are planned at this time.

There were also some outreach attempts that did not generate any response or feedback. The railroads utilizing tracks in the area (CSX, First Coast Railroad, and Genesee & Wyoming) did not respond to requests for information on the logistics of the railroad operation as related to flooding. An informal discussion was set up through Fernandina Beach Main Street (a partnership between the City of Fernandina Beach, Amelia Island-Fernandina Beach-Yulee Chamber of Commerce and the Amelia Island Convention & Visitors Bureau) in an attempt to reach downtown property owners, but no attendance or feedback was received.

ii. Public Outreach

The City also held a public outreach workshop in June 2019 with a presentation highlighting the development of this *Downtown Waterfront Resiliency Master Plan*. An overview of projected flooding and sea-level rise scenarios were presented, as well as a summary of current projects and funding for waterfront resiliency.

The City shared the goals of the *Downtown Waterfront Resiliency Master Plan* which included: to recover quickly from damages, identify vulnerabilities, develop a list of critical assets, and determine possible courses of action. The process of developing a Master Plan supports multiple comprehensive plan objectives.

The Plan also considers the following key objectives related to the Downtown Waterfront Project Area:

- Eliminate tidal/sunny day flooding
- Provide flood protection from storm surge
- Improve electrical system resilience
- Improve railroad safety at interfaces with cars and pedestrians
- Protect historic structures

The City also identified key waterfront infrastructure to include:

- Historic structures
- Marina
- Water and sewer system
- Electrical distribution system
- City Hall

At this meeting, the City proposed to move forward with structural engineering and budgeting studies and to promote the strategies of individual structure protection and green infrastructure. It was suggested that the City could use current funding, data, and plans already completed to increase the pace of resilient projects. An interest in making sure the projects are not narrowly focused, but broadly applicable and beneficial to the public was expressed toward the conclusion of the meeting.

Public feedback on the topic of resiliency indicated a desire for City-wide resiliency in addition to the Downtown Waterfront Project Area. A question was also raised regarding consideration of subsidence as a cause of the flooding. A desire was noted to make information available to individual property owners. This effort has already begun.

On the Fernandina Beach website, there is a page dedicated to information on the development of the *Downtown Waterfront Resiliency Master Plan* and resources for further information, including links to product sheets for flood proofing products. <https://www.fbfl.us/975/Resiliency>¹

II. VULNERABILITY

A. Previous Assessments

The City of Fernandina Beach has considered and assessed its vulnerability prior to embarking on the development of the *Downtown Waterfront Resiliency Master Plan*. In order to determine the vulnerabilities within the Downtown Waterfront Project Area, an informational review of several reports and assessments was conducted as part of the development of this Plan. The primary assessments considered were: NEFRC Sea-level Vulnerability Assessment (Appendix A), the Downtown Waterfront Flooding Assessment (Appendix B), and the Downtown Waterfront Sea-level Rise Study (Appendix C). A full listing of reports and assessments included in the data review is provided in the Background section of the *Downtown Waterfront Resiliency Master Plan*.

B. Shocks and Stresses

Identifying shocks and stresses specific to the Downtown Waterfront Project Area is an important step in assessing vulnerability with a view to reducing the effects of compounding chronic issues with acute severe events. Chronic issues are regularly, recurring stressors imposed on upland assets. Acute, severe events are less predictable shocks that can adversely affect upland assets, especially when combined with chronic recurring issues. In the section that follows, these acute and chronic issues are defined as "shocks" and "stresses" in the context of the Downtown Waterfront Project Area.

The *Downtown Waterfront Resiliency Master Plan* has adopted the definition of "shock" as an acute event or phenomenon threatening major loss of life, damage to assets, and to a city's ability to function and provide basic services.¹ The following acute shocks have been identified by the City of Fernandina Beach.



Figure 2: Photograph showing the effects of storm surge on the project area. Hurricane Matthew was an example of an acute "shock" event. Photo source: City of Fernandina Beach - Downtown waterfront Flooding Assessment (Desilet, 2019)²

Acute Shocks:

- Flooding due to storm surge
- Severe storms and extreme rainfall events
- Heatwaves
- Infrastructure or building failures
- Disease outbreaks

For purposes of this Plan, a “stress” will be defined as an ongoing or cyclical event or phenomenon that renders a city less able to function and provide basic services. The following chronic stresses have been identified by the City of Fernandina Beach.

Chronic Stresses:

- Flooding due to king tides and sea-level rise
- Aging infrastructure
- A lack of mobility

C. Exposure

Exposure defines the frequency and duration at which assets are impacted by the identified shocks and stresses listed above. A critical flood threshold of +5.0 feet North American Vertical Datum 1988 (NAVD88) has been defined for the Downtown Waterfront Project Area.² The critical flood threshold establishes the point at which water levels become stressors on City assets. Water levels within the Downtown Waterfront Project Area can be affected by storm surge, tidal changes, or a combination of astronomical and meteorological factors.

High-tide (or sunny-day) flooding is a result of rising water levels, and subsequent flooding of the upland as the tides increase. According to the nearest NOAA Tidal Station (Fernandina Beach, Station No. 8720030), the tidal range for the Downtown Waterfront Project Area is approximately 6 vertical feet. This means that sunny-day water elevations, on average, vary by approximately 6 feet vertically. Areas of lower elevation along the Downtown Waterfront Project Area are most susceptible to sunny-day flooding.



Figure 3: Photograph showing the effects of sunny-day flooding on the Downtown Waterfront Project Area. Tidally influenced flooding is an example of a chronic “stressor” on upland assets. Photo source: City of Fernandina Beach - Downtown waterfront Flooding Assessment (Desilet, 2019)²

NOAA also tracks Mean Higher High Water (MHHW) levels, which represent an average of the highest observed astronomical tides. At Fernandina Beach, MHHW Elevation is +2.74 feet (NAVD88). The highest astronomical tide for the Fernandina Beach area (the elevation of the highest *predicted* astronomical tide) is +4.55 feet (NAVD88). According to NOAA data the highest ever observed tide was +9.68 feet (NAVD88) which represents the maximum height reached by a rising tide due to a combination of periodic forces and the effects of meteorological conditions. This illustrates the potential compounding effects of stressors combined with a shock storm surge event and helps us to define the exposure of the Downtown Waterfront Project Area.

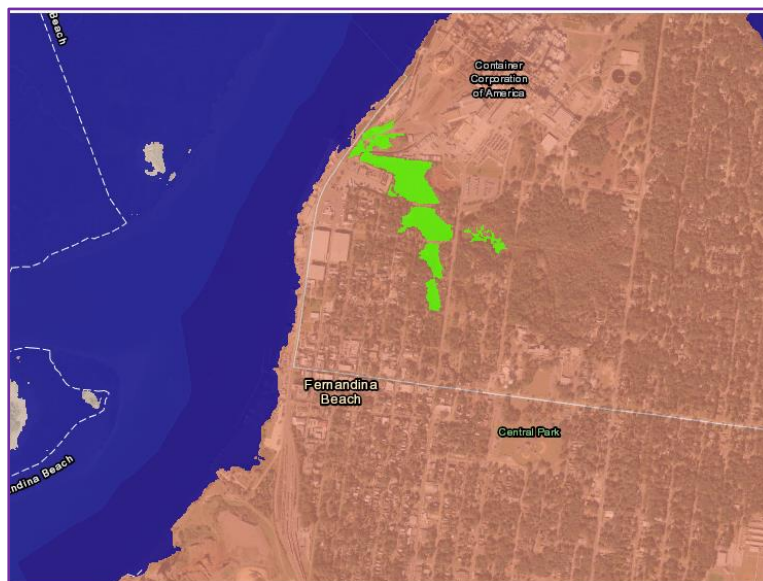


Figure 4: Snapshot of the NOAA Sea-level Rise Viewer set at Mean Higher High Water elevation for the Fernandina Beach area

The Downtown Waterfront Project Area is most likely to experience flooding during a combined high-tide and meteorological event. The Downtown Waterfront Project Area is most susceptible to meteorological-related increases of water elevations during the rainy season, typically occurring from the month of June through October. Weak points of water intrusion, aging infrastructure, and a lack of stormwater controls can all contribute to the prolonged exposure of upland assets to flood-related stresses.

NOAA Station Tidal Data		
Fernandina Beach Station No. 8270030		
MHHW Elevation	2.74	NAVD88 Datum
HAT	4.55	NAVD88 Datum
Max Tide	9.68	NAVD88 Datum
Mean Tidal Range	6.02	NAVD88 Datum

Figure 5: NOAA Fernandina Beach Station Tidal Data, Converted to NAVD88 Datum

The City of Fernandina contracted Ayres Associates, Inc. to conduct a structural inspection and assessment of the existing seawalls at Fernandina Harbor Marina.³ The governing top of seawall elevation (south end) for the Marina Harbor waterfront is approximately +5.2 feet (NAVD88). The majority of Front Street is at (or above) the grade of the existing seawall; however shoreline areas north of Harbor Marina are at lower elevations and are susceptible to the intrusion of flood waters.

The Downtown Waterfront Flooding Assessment² assumes a critical flood threshold of +5.0 feet (NAVD88) based on the NOAA Sea-level Rise Viewer tool (Intermediate Scenario). The tool shows that water levels at an approximate elevation of +5.0 feet (NAVD88) lead to significant inundation of the Downtown Waterfront Project Area. This elevation is reported to correspond with a 25 percent annual probability of flood event occurrence (four-year return period). This is the current predicted exposure to the critical flood threshold elevation for the Downtown Waterfront Project Area. Exposure of Project Area assets to waters at or above the critical flood threshold of +5.0 feet (NAVD88) will increase with sea-level rise.

D. Sensitivity

Sensitivity considers the degree of impact on the Downtown Waterfront Project Area assets when impacted by shocks and stressors. As sea-level rise compounds the effects of astronomical and meteorological high tides, the Downtown Waterfront Project Area will become more sensitive to triggers for tidal elevation increases. High tide water elevations are predicted to exceed the critical flood threshold water elevation (+5.0 feet NAVD88) by approximately 2070 (USACE intermediate predictions for sea-level rise). This means that by the year 2070, the frequency of water elevations exceeding critical thresholds will become a normal tidal occurrence.

Small increases in sea-levels can cause significant impacts on the frequency of flooding. An increase in sea-level rise of only +0.32 feet will double the annual probability of exceeding the critical flood threshold. In other words, the four-year storm will become the two-year storm (50 percent annual probability of occurrence). The relatively low elevation of the Downtown Waterfront Project Area combined with its exposure to tidal influences increases the sensitivity of the Project Area to sea-level rise.

The NOAA Sea-level Rise Viewer tool estimates +1.05 feet of sea-level rise by 2040 in the intermediate scenario for Fernandina Beach. The U.S. Army Corps of Engineers intermediate estimate for sea-level change in Fernandina Beach by 2100 is +1.75 feet compared to a baseline of the year 1992. From present day, the intermediate estimate is an increase in sea-level of approximately +0.43 feet by 2050 and +1.5 feet by 2100.⁴

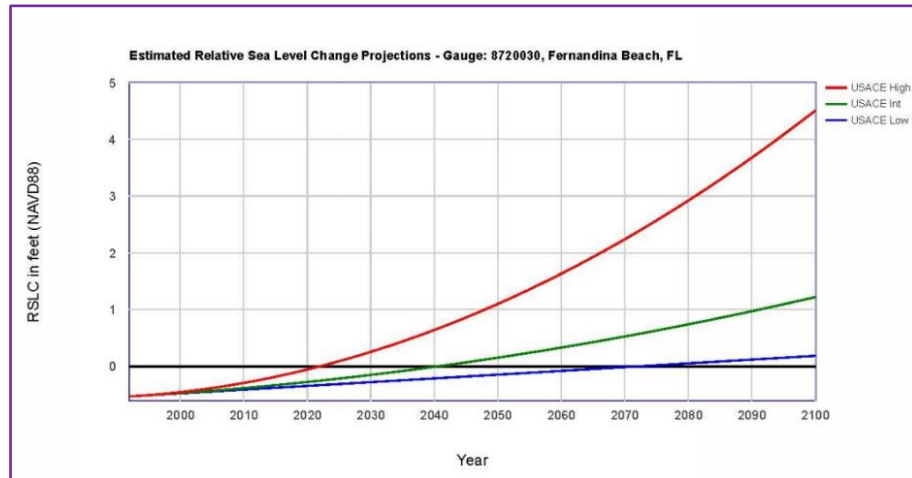


Figure 6: USACE predictions for sea-level rise at Fernandina Beach. Relative Sea-level Change is measured in feet.

Currently, Fernandina Beach sees a few days of high tide (sunny day) flooding per year. Using the USACE intermediate scenario sea-level rise projections, it is predicted that Fernandina Beach will see 24 or more annual days of high tide flooding per year, by approximately the year 2030 based on a high tide flooding threshold elevation of 4.64 ft for Fernandina Beach.

E. Adaptive Capacity

Adaptive capacity is a measure of the asset's ability to adjust, repair, or respond to stressors. Some of the previous assessments conducted by the City evaluated the adaptive capacity of specific City assets. For example, the City contracted Ayres Associates, Inc. to conduct a structural inspection and assessment of the existing seawalls.³ Their Fernandina Harbor Marina Seawall Assessment report assisted the City in assessing the Downtown Waterfront Project Area's adaptive capacity as the marina seawall is the downtown's first defense to invading waters. The Seawall Assessment Report estimates a useful service life expectancy of 5 years from the time of inspection if no maintenance is conducted, and 20 years if the seawall is repaired and maintained. These findings indicated an area of potential improvement in the Downtown Waterfront Project Area's adaptive capacity, which contributed to the City's adaptation planning.

There have also been efforts to evaluate and improve the network connectivity and mobility of the Downtown Waterfront Project Area. The Waterfront CRA Master Plan Traffic Circulation and Parking Study⁵ listed *network connectivity* as the degree to which walkways and roadways allow direct pedestrian or vehicular travel between destinations and discussed ways to improve this within the 'Waterfront Community Redevelopment Area (CRA)' which is within the designated Downtown Waterfront Project Area, that this Plan discusses. Aside from network connectivity, the ZCA Study also looked at parking, and traffic circulation within this area, which gives a good baseline of mobility concerns and provides relevant suggestions for the Downtown Waterfront Project Area. The network capacity was described as more than capable of supporting increased traffic. Redevelopment efforts should take this, and recommendations to improve connectivity, circulation, and parking into account when designing improvements to the Downtown Waterfront Project Area.

Increased pedestrian connectivity was one of the focused topics within the traffic study, highlighting a need for more sidewalk and pedestrian level amenities for the, “approximately 18,000 linear feet of missing sidewalks”. The Waterfront CRA Master Plan Traffic Circulation and Parking Study also outlines the need for a separation between railroad, and community space by suggesting a vegetative buffer running along the proposed ‘Front Street Corridor.’ This aligns with the goal of increasing railroad safety as discussed during the community presentation of the *Downtown Waterfront Resiliency Master Plan*. A combination of resiliency strategies listed within this Plan could be utilized moving forward with suggestions from the 2009 Waterfront CRA Master Plan Traffic Circulation and Parking Study. Railroad crossings were the other immediate connectivity recommendation provided by the Waterfront CRA Master Plan Traffic Circulation and Parking Study. Fernandina Beach Front Street Improvements Conceptual Plans seemingly take into consideration the suggestions for increased railroad crossings – one crossing minimum at Alachua Street with a second, ideally at Broome Street. The Fernandina Beach Front Street Improvements Conceptual Plans and the Fernandina Beach 90% Alachua Street Improvements⁶ provide one additional vehicle crossing at Alachua Street with an additional pedestrian crossing at Broome Street. In conclusion, applying recommendations discussed above will contribute to easing the chronic stress caused by a lack of mobility within the Downtown Waterfront Project Area.

III. ADAPTATION PLANS

A. How the City is Adapting

The City has already begun work to develop adaptation strategies which address current and future impacts of shocks and stressors on the Downtown Waterfront Project Area.



Figure 7: Photograph of the Fernandina Beach Harbor Marina, one of the Downtown Waterfront Project Area assets. Photo Source: Ayres Associates, Inc. Fernandina Harbor Marina Seawall Assessment (2018).³

Well-designed stormwater systems can prevent some of the inflow of water during a rising tide event, and also allow for efficient relief of built-up stormwater after a significant event. Stormwater projects currently being pursued by the City include the Area 5 Alachua Street upgrade and stormwater lift station, the Area 6 conceptual plan, and the Area 7 conceptual plan.

The City has conducted traffic studies⁵ to assess connectivity and traffic circulation in the Downtown Waterfront Project Area. An adaptation strategy for addressing this issue is to provide alternate route options, especially for trucks accessing the waterfront.

The adaptive capacity of historical assets within the Downtown Waterfront Project Area has also been considered. The Fernandina Beach Downtown Waterfront Resiliency Master Plan webpage references the National Trust for Historic Preservation guidelines on “dry floodproofing” which includes sealing at-risk buildings below the highest expected flood levels using a combination of sealant systems, and the installation of removable shields on openings such as doors, windows, vents, etc. Links to product sheets for floodproofing products can be found on the Downtown Waterfront Resiliency Master Plan webpage.¹

Utility infrastructure must be designed to be submerged or elevated above projected high water levels. Utility improvements include water/sewer and electrical systems.

Shoreline protection design is the first defense against rising tides, and adaptation strategies are considered on a case-by-case basis along the shoreline. Effective improvements range from green to gray, meaning a varied approach is necessary to address adaptation through shoreline protection. Potential improvements include living shorelines (e.g., vegetation buffers or vegetation buffers with edging or sills) and hardened or semi-hardened coastal structures (e.g., breakwaters, revetments, or bulkheads).

Green infrastructure promotes the use of green spaces in planning and design over impermeable surfaces, which tend to exacerbate flood conditions. Possible green infrastructure adaptation items include permeable pavers, rainwater harvesting cisterns, green roofs, stormwater planters, dry wells, and conscientious storm drain design. The City is projecting to release a Low Impact Development Design Manual in 2020.⁷

On August 6, 2019, the City of Fernandina Beach Commission Regular Meeting included a “Waterfront Concept” presentation as Item 4.6. City Manager Martin presented an updated plan for a waterfront park concept within the Downtown Waterfront Project Area. The Waterfront Concept Plan provided an update to a waterfront park plan previously adopted by the Commission in 2012. City Manager Martin presented plans to include enhanced safety controls at the Ash Street and Center Street crossings, paid for by the FDOT. The Waterfront Concept Plan also includes relocating the Atlantic Seafood facility, additional retail structures (potentially to the benefit of the Marina Fund), a fence and sidewalk along the railroad, overall reduction in parking, and additional open green space for varied uses. City Manager Martin indicated that the Waterfront Concept Plan seeks to work toward a restful, open, welcoming, waterfront environment for families and the general public to enjoy. At the conclusion of the presentation, a motion was passed to approve the Waterfront Park Footprint and have the approved footprint be passed to the Parks and Recreation Department for further development. Other next steps include pursuing funding, developing a plan for the shoreline, and acquiring additional land needed for the park. For more information, view Item 4.6 of the August 6, 2019, Commission Regular Meeting.⁸

In summary, adaptation improvements currently under consideration for the Waterfront Development Project Area include stormwater upgrades, traffic flow improvements, pedestrian safety improvements, dry floodproofing, utility infrastructure adaptation, hardened shoreline improvements, and green infrastructure. Implementing these design measures will increase the adaptive capacity of the Waterfront Development Project Area.

B. Current Plans Underway

The City has initiated projects that address resiliency within the Downtown Waterfront Project Area. To combat some of the stresses associated with increased flooding scenarios and decreased mobility, the City of Fernandina Beach has budgeted Front Street improvements scheduled for 2019 – 2020 with other street improvements scheduled through years 2022 – 2023. These street improvements will likely contribute to resolving smaller issues like the need to restore curbs in some areas to reestablish conveyance as mentioned in the Stormwater Master Plan.⁹ Funding for combatting large volumes of stormwater by implementing a new lift / pump station within Area-5 addresses the lack of stormwater

storage in the Downtown Waterfront Project Area and is scheduled within the CIP for years 2018 – 2020. The proposed pumps will direct floodwaters to the Amelia River and help combat the increasing frequency, of 10yr/24hr storm events and subsequent flooding of City streets.

The Waterfront Concept plan for a park footprint adopted on August 6, 2019 will also contribute to adding green spaces and improving mobility within the Downtown Waterfront Project Area.

C. Summary of Recommended Strategies

A data-driven assessment of vulnerabilities contributed to the development of focused adaptation strategies targeted at improving resilience within the Downtown Waterfront Project Area. The Florida Department of Environmental Protection (FDEP) Adaptation Planning Guidebook¹⁰ lists four types of adaptation strategies:

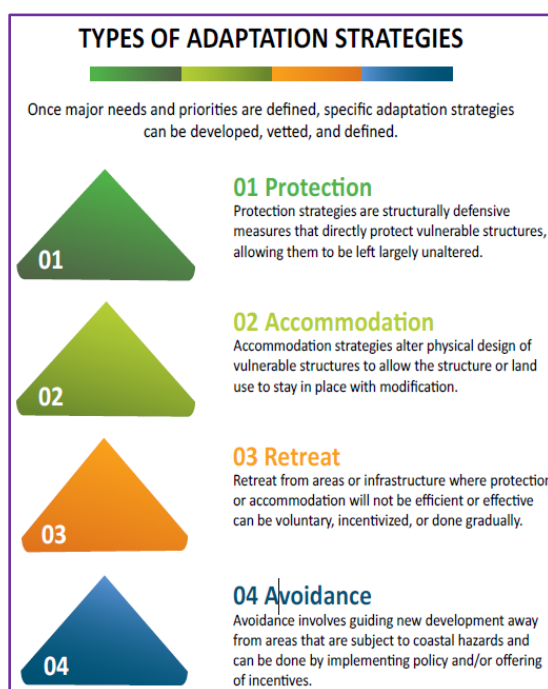


Figure 8: Types of Adaptation Strategies. Source: Florida Department of Environmental Protection Adaptation Planning Guidebook (2018).¹⁰

Given the narrow scope of the Downtown Waterfront Project Area, this Plan focuses on identifying strategies to protect or accommodate assets within this area. Consideration was given to how potential adaptation strategies would relate to the specific shocks and stresses identified by the City.

Adaptation Strategies		
Shocks and Stresses		Recommended Strategies
Shocks	Flooding - Storm Surge	Dry Floodproofing, Permeable Pavers, Shoreline Stabilization, Tidal Valves, Upstream Stormwater Infrastructure
	Heat Wave	Upstream Stormwater Infrastructure
	Infrastructure or building failure	Upstream Stormwater Infrastructure, Wet flood-Proofing (retro-fit)
	Disease outbreak	Tidal Valves
Stresses	Flooding - sea-level rise / king tide	Dry Floodproofing, Permeable Pavers, Shoreline Stabilization, Tidal valves, Upstream Infrastructure Retrofit
	Aging Infrastructure	Upstream Stormwater Infrastructure, Wet Flood-proofing (retro-fit)
	Mobility	Upstream Stormwater Infrastructure, Shoreline Stabilization, Tidal Valves

The summary sheets provided in Appendix D offer a menu of adaptation strategies that could be implemented within the Downtown Waterfront Project Area. Each of these summary sheets provides the following key information for the recommended strategy:

- Adaptation strategy description
- Scope of the strategy – is it site-specific or applicable to the broader planning area?
- Anticipated level of benefit
- Anticipated level of cost
- Indication of which shocks and/or stresses the strategy relates to
- Description of applicability of the strategy to assets or vulnerabilities
- Information on how or where the strategy may be implemented
- Anticipated Co-Benefits (social, environmental, mobility)
- References for additional information

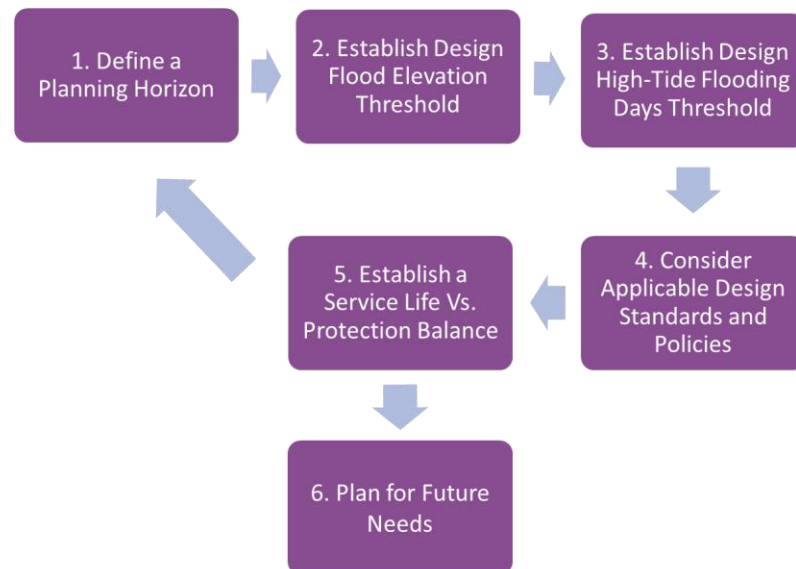
IV. IMPLEMENTATION

A. Planning for Sea-level Rise and Flooding

The City of Fernandina Beach has established the USACE intermediate curve as the sea-level rise scenario for planning decisions and capital improvement projects. Additional detailed modeling may determine more specific requirements, but this is the current basis for planning projects in the Downtown Waterfront Project Area.

B. General Design Guidelines

General design guidelines have been prepared to assist developers, property owners, and residents to adapt to predicted increases in water levels. The following design guidelines will help those living and working within the Downtown Waterfront Project Area adapt to the new norm by outlining a process for selecting design elevations and planning horizons. Consider planning new development, restoration, or repair work with these guidelines in mind.



i. Define a Planning Horizon

Adaptation planning horizons should be established before planning begins. Planning horizons can be classified into three basic levels:

- Near-term (Less than 5Yrs)
- Mid-term (5Yrs – 15Yrs)
- Long-term (Greater than 15Yrs)

Understanding whether a project is likely to be near-term, mid-term, or long-term will provide a starting point for considering design criteria.

ii. Establish Design Flood Elevation Threshold

What is the point at which flooding becomes a problem for the asset or site being designed? According to the Downtown Waterfront Flooding Assessment², a critical flood threshold of +5.0 feet (NAVD88) has been established for the Downtown Waterfront Project Area. While this provides a general idea, the design flood elevation threshold must be considered on a case-by-case basis. Determine whether or not the asset to be repaired or constructed is able to accept flood levels below the established threshold without critical failures or significant fatigue stress. If the asset cannot accept waters at the established critical flood threshold for the area, consider setting your design flood elevation threshold at or higher than the +5.0 feet (NAVD88) elevation.

iii. Establish Design High-Tide Flooding Days Threshold

For the purposes of this resiliency plan, the high-tide flooding days threshold considers how frequently an asset can be flooded. The frequency of flooding is evaluated based on the high tide flooding threshold of 4.64 ft for Fernandina Beach. A starting point of 24 days (or two times a month) can be used, but like other design criteria, the acceptable threshold for high-tide flooding days should be reviewed on a case-by-case basis. Based on the Intermediate sea-level rise scenario, high-tide flooding will occur 24 or more days per year in the Downtown Waterfront Project Area by 2030.² If the asset cannot accept 24 days of flooding per year in that time frame, consider setting the design flood elevation threshold greater than the high tide flooding threshold for Fernandina Beach.

iv. Consider Applicable Design Standards and Policies

Several policies and guidelines have been established or are in the process of development to help communities build responsibly with a view to changing water levels. During design, consult applicable planning policies and design standards which may include (but are not limited to) the following:

- ASCE 24 Flood Resistant Design and Construction (latest edition)
- ASCE 7 Minimum Design Loads for Buildings and Other Structures (latest edition)
- FEMA Policy, Minimum Design Standards for Hazard Mitigation Assistance Projects in Flood Hazard Areas (latest revision)
- Florida Building Code, Flood Resistant Construction (latest revision)
- City of Fernandina Beach Chapter 22 Buildings and Building Regulations, Article V Floodplain Management (latest revision)
- Amelia River Waterfront Community Redevelopment Area (CRA) Guidelines (2007 or latest edition).

v. Establish a Service Life Vs. Protection Balance

Once a planning horizon is defined, and design flood thresholds have been established the expected level of protection within a given horizon period can be predicted using the results of the Downtown Waterfront Flooding Assessment.² The assessment predicts sea-level rise and frequency of exceedance of critical flood water elevations by a projection year. When implementing repairs, retro-fits, or re-design of coastal structures or upland water management improvements the useful life of the structure need not substantially exceed projections for which it was designed. For example, if a proposed seawall is designed with a top-of seawall elevation corresponding to high tide elevation projections for 2025 and has a service life design extending 50 years to 2050, the service life vs. protection balance should be reconsidered. This step may be an iterative process, as illustrated in the Design Guidelines flowchart.

vi. Plan for Future Needs

A service life vs. protection balance can be achieved by adjusting the design and sequencing of construction. Sometimes it is economically impractical to immediately implement infrastructure adaptation changes for the worst-case scenarios of sea-level rise and storm surge. Considerations when adjusting the proposed design to achieve a service life vs. protection balance may include building in options for phasing. For example, a near-term seawall foundation may be designed more robustly than presently necessary to allow for future upgrades to withstand higher water levels. Some construction costs can be deferred to future planning horizons by incorporating scalable design options.

C. Integration with City Plans and Policies

Adaptation planning can also be integrated into specific local plans and policies. Below is a list of City plans and policies that are in the process of being updated with adaptation planning strategies.

i. Floodplain Ordinance

The City floodplain ordinance is currently being drafted. Proposed recommendations include:

- Increase to 2' freeboard requirement
- Expansion of freeboard requirements to 500yr floodplain
- Restrictions on new critical facilities in the floodplain

ii. Comprehensive Plan

There are several comp plan objectives that relate to resiliency/adaptation:

- MTE Objective 2.11 Waterways
- HE 3.02.04, Objective 3.06 Energy Efficiency and Sustainability
- PFE Objectives 4.02, 4.03, 4.05
- CCME Objectives 5.02, 5.03, 5.04, 5.05, 5.06, 5.07, 5.08, 5.10, 5.11, 5.12, 5.13, 5.14
- ROSE Objectives 6.05, 6.07, 6.10
- ICE Policies 7.01.09, 7.01.10, 7.04.11, 7.04.13
- CIE Generally
- HPE Objective 11.05
- EDE Generally

iii. Land Development Code

The land development code will be updated to further the comp plan objectives. The City is also currently developing a Low Impact Development Design Manual to be released in 2020.

D. Project Scorecard

The adaptation strategies and design guidelines outlined in this Plan help the City to do just that – plan ways to improve resilience. The next step is to transition to implementation activities to move these strategies from plan to action. In order to help evaluate and prioritize projects that incorporate adaptation strategies, the City of Fernandina Beach is utilizing a project evaluation scorecard.

One of the key goals of this resiliency planning process was to provide the City with a tool to help prioritize projects based on their ability to increase/enhance the resilience of the city and key vulnerable assets to the shocks and stresses of concern identified in this Plan. Previous reports had done a good job characterizing hazards, assessing vulnerability, and identifying the need for action. The next step for the City was to determine how to use this information to inform project planning and action. Information from these past studies as well as feedback from the City's Resiliency Steering Committee was used to develop a scorecard to support evaluation of capital improvement projects.

i. What is the resilience scorecard?

The Resilience Scorecard (Appendix E) provides a scoring system that enables the City to evaluate projects by giving each project a comparable "resilience score" and then rank projects according to their 'level of resilience' potential. Using this scorecard, the City can identify, prioritize and build capital projects that will have the most significant resilience benefits to the City. The scorecard is a detailed framework that includes a range of project information, resilience criteria that a project should address, a comprehensive set of project co-benefit impacts (negative and positive) that a project can potentially provide, and considerations for ease of project implementation.

ii. What does the resilience scorecard evaluate?

The resilience scorecard is designed to evaluate a project's resilience performance across three broad categories:

- *Resilience to Shocks and Stresses*: this category assesses the project's ability to withstand shocks and stresses
- *Contribution to Overall City Resiliency*: this category assesses the project's ability to provide overall benefits to the city including quality of life for residents and advancing progress towards goals laid out in other city planning initiatives
- *Feasibility of Project Implementation*: this category assesses potential advantages and obstacles to project implementation

Several "resilience performance criteria" have been identified in each of these three main categories. These criteria are summarized below and defined in more detail in Appendix E.

Resilience Evaluation Criteria
Reliability
Resistance
Recovery of Assets
Redundancy

Benefits Evaluation Criteria
Benefit-Cost Ratio
Moderation of shocks/stresses on assets within the Downtown Waterfront Area
Integration of historic preservation
Integration of social benefits
Integration of mobility considerations
Impact on insurance rates
City Comprehensive Plan element compliance
Integration of life/safety protection

Implementation Screening Criteria
Permitting
Scalability
Availability of Match Funding or Grant Eligibility
Implementation timeframe
Political support or sponsorship
Ownership & Accessibility
Public Outreach Effort

V. NEXT STEPS

The *Downtown Waterfront Resiliency Master Plan* is a first step in addressing resiliency for the City of Fernandina Beach. This Plan can be used as a framework to apply to other areas of the City. The process of identifying vulnerabilities, reviewing adaptive capacity, and developing adaptation strategies can be extended to other focus areas, and eventually, community-wide. Some of the key elements of this Plan will also benefit or be applicable to a wider area from the start – specifically, the City policies and the CIP project scorecard.

This Plan outlines vulnerabilities within the Downtown Waterfront Project Area and a menu of potential strategies and design guidelines that can be utilized to address those adaptation needs. The next step in the planning process is to identify specific projects through which these strategies can be implemented. The CIP scorecard tool can be utilized to evaluate and prioritize potential projects. As specific projects are selected for implementation, timelines can be set. In the meantime, the City is working to identify potential funding sources and requirements.

One such specific project that is key to the next steps in implementing resiliency along the downtown waterfront is the recently adopted Waterfront Park Footprint. This project is planned to include further evaluation of the shoreline stabilization needed to protect the Downtown Waterfront Project Area.

As demonstrated by the cyclical figure on the City's Waterfront Resiliency Master Plan webpage¹, a resilient community will continue to review and adapt to changing conditions. As City policies are adopted and projects are selected, a continuation of public outreach and communication efforts will help to keep the community informed and engaged.

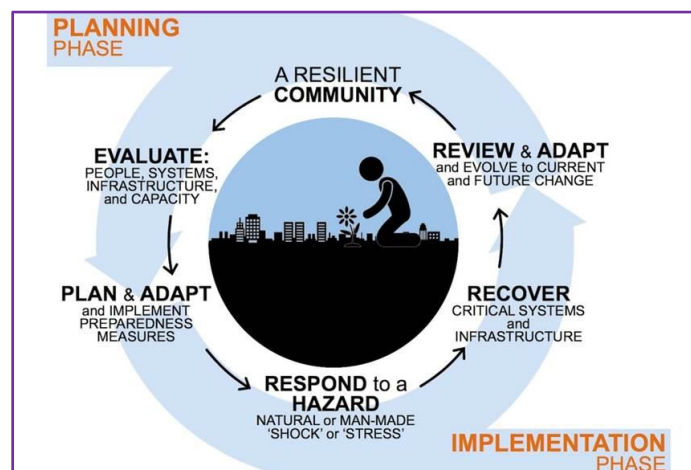


Figure 9: Resiliency Planning Process. Source: City of Fernandina's Waterfront Resiliency Master Plan website (2019).¹

CITED REFERENCES

1. City of Fernandina's Waterfront Resiliency Master Plan website <https://www.fbfl.us/975/Resiliency>
2. City of Fernandina Beach – Downtown Waterfront Flooding Assessment, prepared by Andre Desilet, PE. August 2019.
3. Fernandina Harbor Marina Seawall Assessment, prepared by Ayres Associates, Inc. Report dated October 22, 2018.
4. U.S. Army Corps of Engineers Sea-level Change Curve Calculator. Scenario Source: USACE2013/NOAA2012, using Regional Data for SLC Rate. This tool is accessible at http://corpsmapu.usace.army.mil/rccinfo/slc/slcc_calc.html
5. Waterfront CRA Master Plan Traffic Circulation and Parking Study, prepared by Zev Cohen & Associates, Inc. received by the City of Fernandina on March 20, 2009.
6. City of Fernandina Beach 90% Alachua Street Roadway Improvements, prepared by Zev Cohen & Associates, Inc. dated April 2, 2012.
7. COFB Waterfront Flood Protection Project Presentation, prepared by Andre Desilet, PE. August, 2018.
8. City Commission Regular Meeting, Item 4.6. August 6, 2019 Available online: <https://fernandina.beachfl.swagit.com/play/08062019-1252>
9. City of Fernandina Beach 2016 Stormwater Master Plan Update; prepared by GAI Consultants, dated December 2016.
10. Florida Department of Environmental Protection Adaptation Planning Guidebook published June, 2018.



APPENDIX A

NEFRC Sea-level Vulnerability Assessment

Brief coastal vulnerability assessment for the City of Fernandina Beach, conducted utilizing NOAA and UF GeoPlan tools.

Vulnerability Assessment

City of Fernandina Beach

Northeast Florida Regional Council

North Central Regional Planning Council

Funded by Florida Department of Economic Opportunity



Vulnerability Assessment – City of Fernandina Beach

Background

This project is working to promote the preparedness of Florida communities by increasing understanding of, access to, and utilization of a range of existing tools that provide additional information on the effects of climate change. Projected sea level rise impacts are another threat contributing to the vulnerability of Florida's at-risk coastal resources.

In conjunction with DEO and NOAA office for Coastal Management, a partnership was developed throughout the state led by South Florida Regional Council, and the remaining 9 Regional Planning Councils (RPCs). The RPCs were paired up for their relative geographic locations to approach this project development. The Northeast Florida Regional Council was paired with the North Central Regional Planning Council. One purpose is to train the trainers that would disseminate the information and toolset usage through the communities and counties in the State. The project title reflects this goal: "Trainers and Tools: Building Coastal Flood Hazard Resiliency in Florida's Regional Planning Council Communities." Ultimately, each Council did a vulnerability assessment for one of their communities (North Central RPC worked with Cedar Key in Levy County) and they collaborated on a training of flood plain planners and managers on using the tools.

This report is a vulnerability assessment of Fernandina Beach that will investigate sea level rise impacts on:

- Transportation infrastructure
- Historic Resources
- Major Employment Centers (Mills, Port)

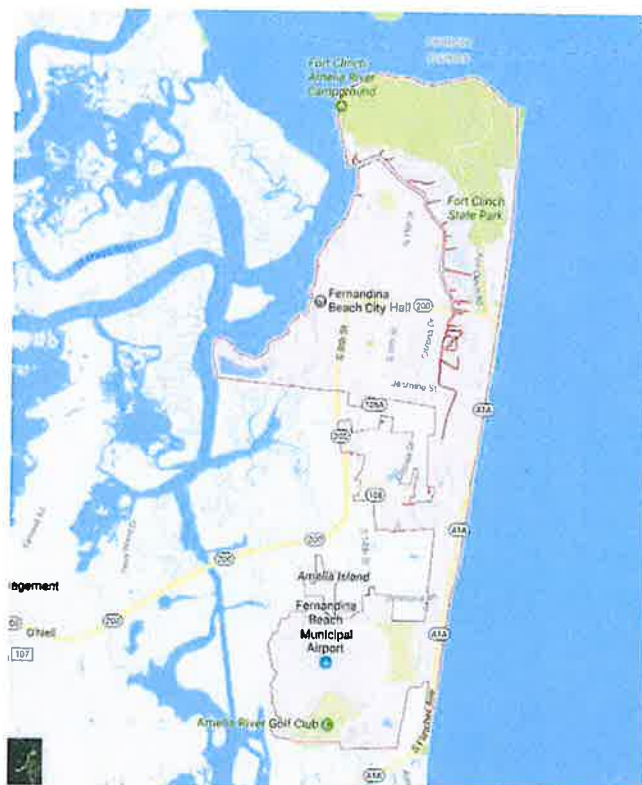
Location

The City of Fernandina Beach is located in Nassau County, on Amelia Island. The City is located on a barrier island with the Amelia River on its west side and the Atlantic Ocean on its east.

Socio-Economic Data*

- 11,487 population
- 7,064 housing units
- \$45,954 median income

**2010 Census data*

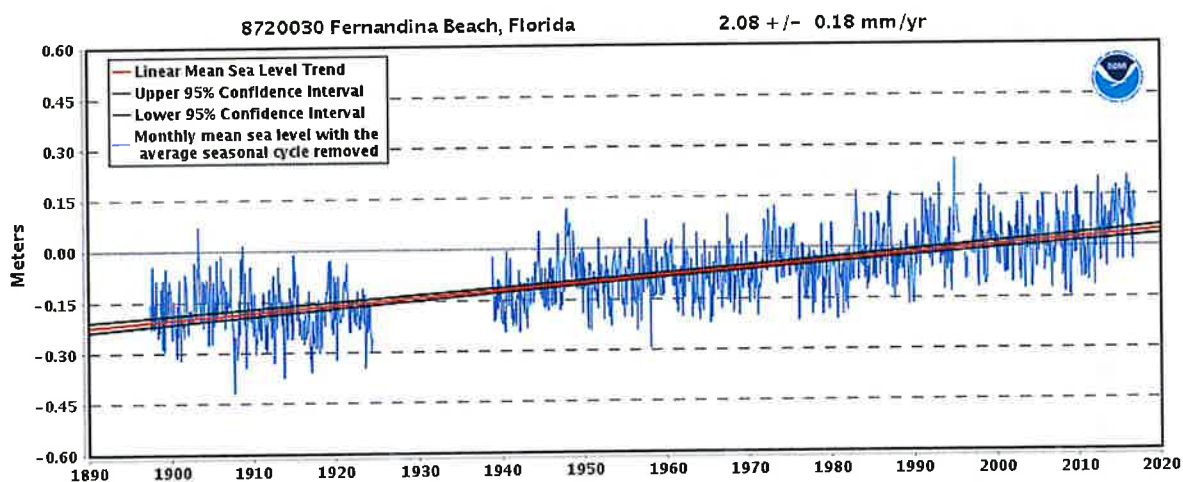


Overall Perspective on Scenarios and Projections

In Northeast Florida, the conversation on climate change is ongoing. Whether or not there is belief in certain scenarios based on overall global warming or other manifestations of climate change, empirical measurements have indicated increases in sea level in the lower coterminous states. NOAA has tide gauges placed throughout the United States and a number of these have been in operation for a long enough period to use as a comparison ‘yardstick’ for recording sea level over time.

In the geographic area of this assessment, the Fernandina Beach gauge is the closest of such long-term NOAA placements. Because of this long-term recording of data, we have information going back before 1920. This data (Figure 1) shows us an upward trend, although shallow, but upward none-the-less. The mean sea level trend is 2.08 millimeters/year with a 95% confidence interval of ± 0.18 mm/yr based on monthly mean sea level data from 1897 to 2015 which is equivalent to a change of 0.68 feet in 100 years.

Figure 1: Sea Level Rise Measurements at Fernandina Beach Tide Gauge



Beyond 2016, we know that the level will rise, but by how much is subject for much debate. Within the scientific community, there are a number of theories and scenarios. In North America, there are three generally recognized scenarios; Intergovernmental Panel on Climate Change, NOAA Coastal Services (Figure 2 below), and U.S. Army Corps of Engineers (Figure 3 below).



Figure 2: NOAA Sea Level Rise Projection

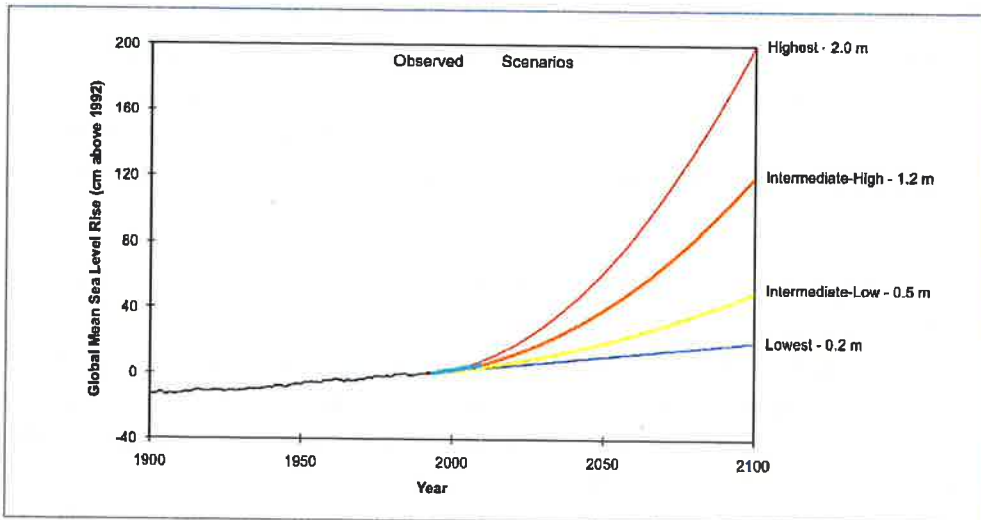
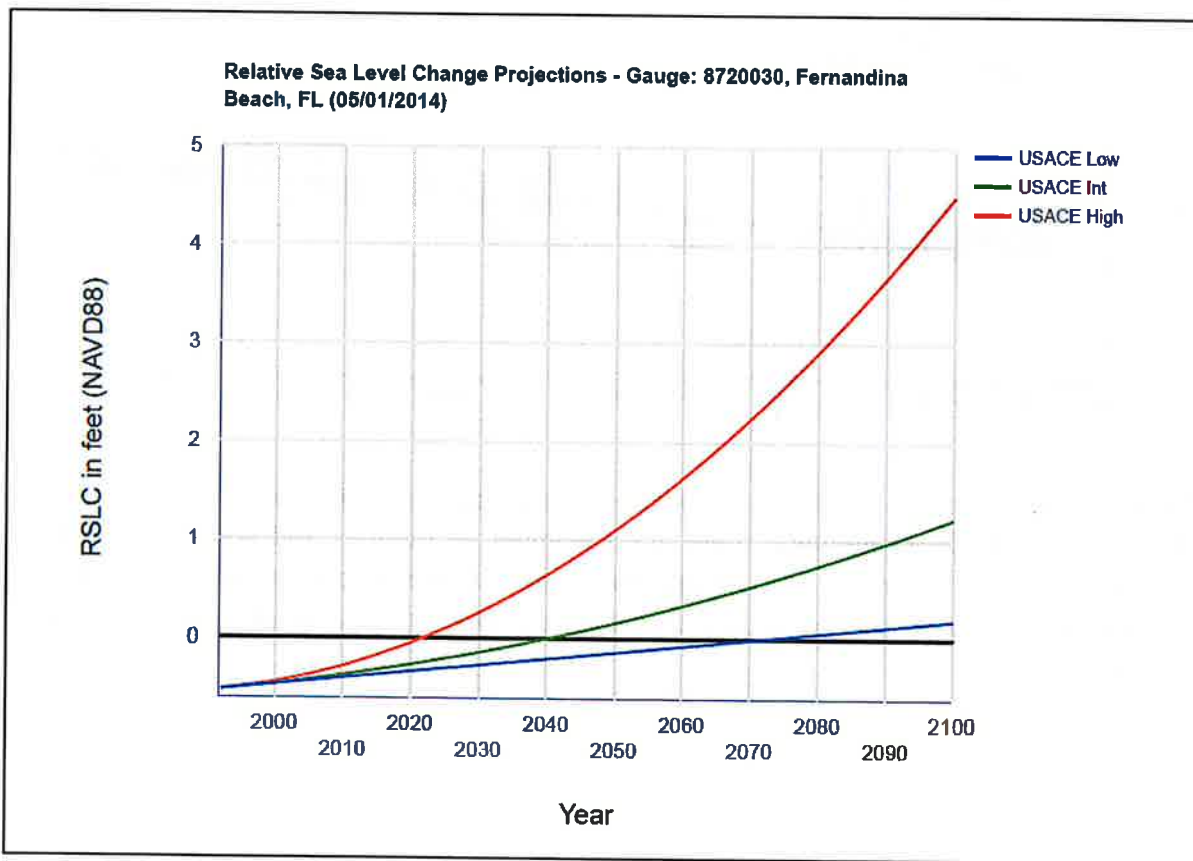


Figure 3: U.S. Army Corps of Engineers Sea Level Rise Projections





Regional Assumptions

The Northeast Florida Region, as a part of the work of the Public Private Regional Resiliency (P2R2) Committee of the Northeast Florida Regional Council has adopted regional assumptions for Sea Level Rise. These are:

- 1 to 3 feet by 2060
- 3 to 6 feet by 2110

Assessment Tools

1. Coastal Flood Exposure Mapper

This online tool was developed by the NOAA Coastal Services and has a multi-layered approach to depicting flood exposure. This is the description of the background for developing the tool:

In recent years, with many universities and states developing risk and vulnerability assessments, our agency updated its approach to focus more on community engagement and less on a prescribed way to conduct an assessment. We developed the Coastal Flood Exposure Mapper to help communities' kick-start conversations about coastal risks. The mapper enables users to explore maps that show people, places, and natural resources exposed to coastal flood hazards and create a collection of maps to share and communicate about flood exposure.

2. Sketch Planning Tool

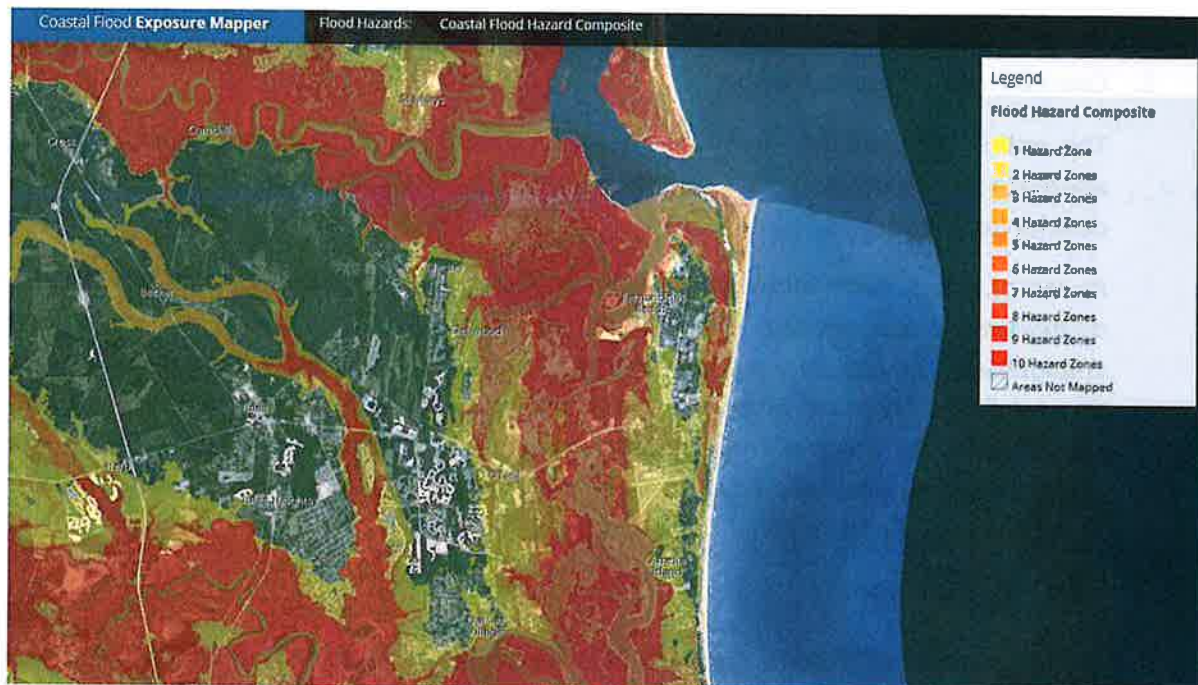
The University of Florida GeoPlan Sea Level Scenario Sketch Planning Tool was developed with funding from the Florida Department of Transportation Office of Policy Planning. The purpose of the tool is to facilitate the identification of transportation infrastructure potentially at risk from projected sea level changes. The tool visualizes various sea level scenarios at future time periods in an effort to inform transportation planners and highlight infrastructure for potential avoidance, minimization, or mitigation.

Flood Hazard Assessment

The maps below illustrate how the Flood Exposure mapper can give snapshots of pre-selected variables and community risks with flood potential. All flood threats can be explored, including inland rain flooding (FEMA FIRM). Using this tool is a rather simple and quick way to understand the possible risks involved with flooding and increase risk awareness for coastal areas around the state and country.

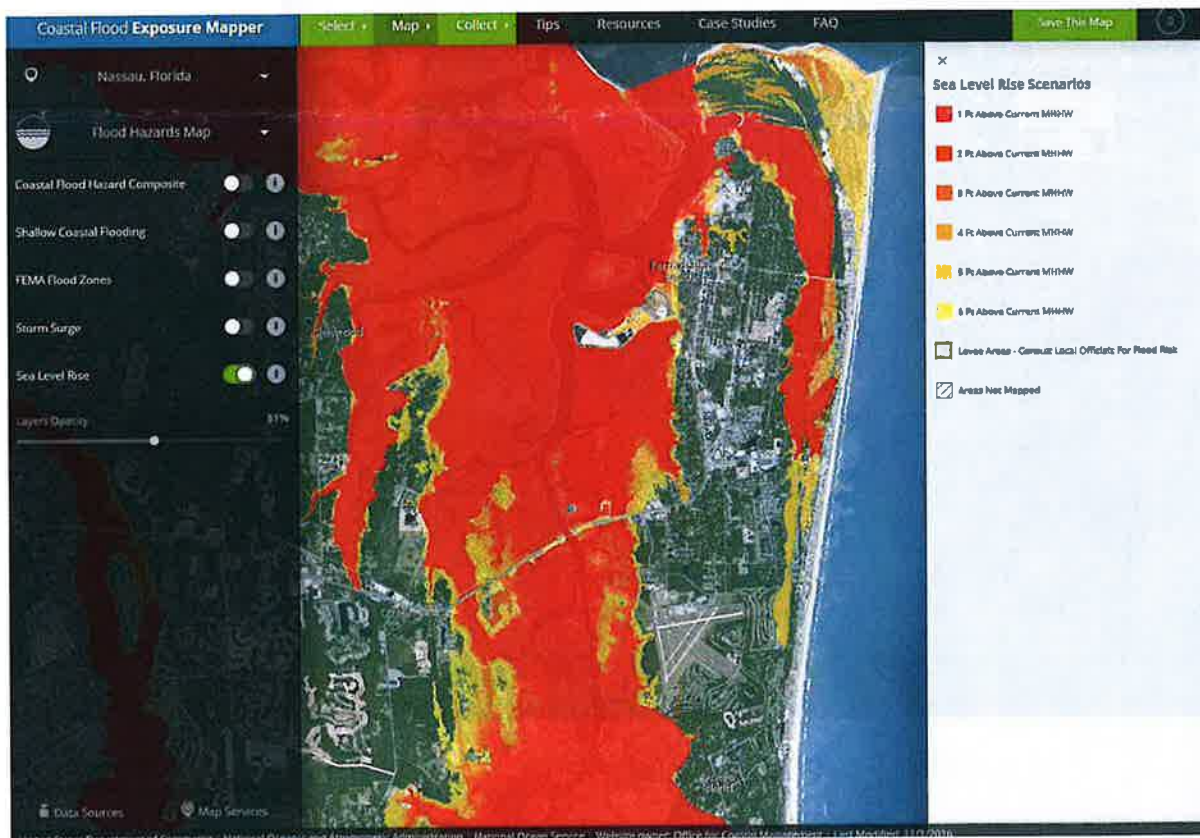
The first map (Figure 4) is a composite index, which depicts all flood hazards on one map. Flood hazards include: storm surge, sea level rise, flooding (based on FEMA Flood Zones), and shallow coastal flooding.

Figure 4: Flood Hazard Composite Map



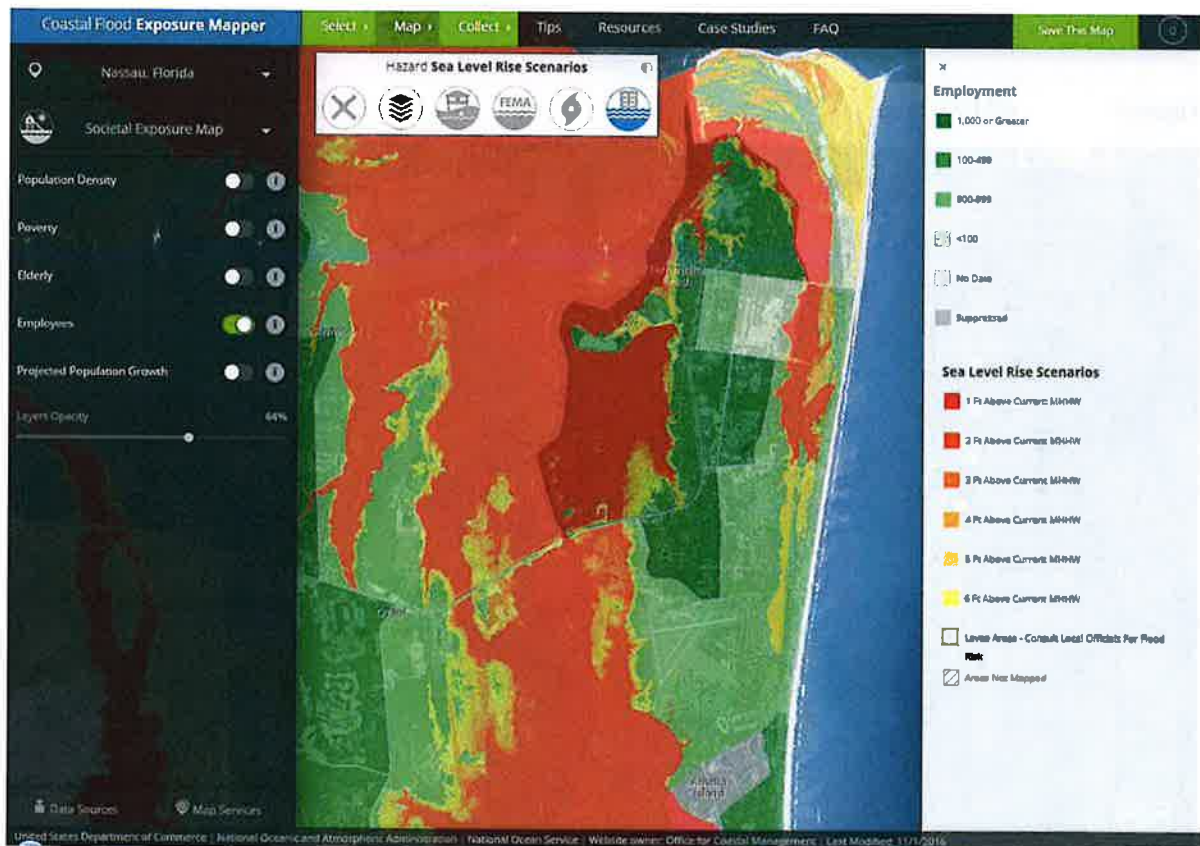
The map below (Figure 5) illustrates sea level rise. According to the tool, the map illustrates “how sea level rise scenarios of 0 to 6 feet, which represent a rise in water above the average of the highest high tides (called mean higher high water, or MHHW) for hydrologically connected areas. Areas that are lower in elevation will be exposed to flooding from sea level rise first and are represented by the darkest red.” There are no time horizons associated with the varying levels of sea level rise.

Figure 5: Sea Level Rise Map



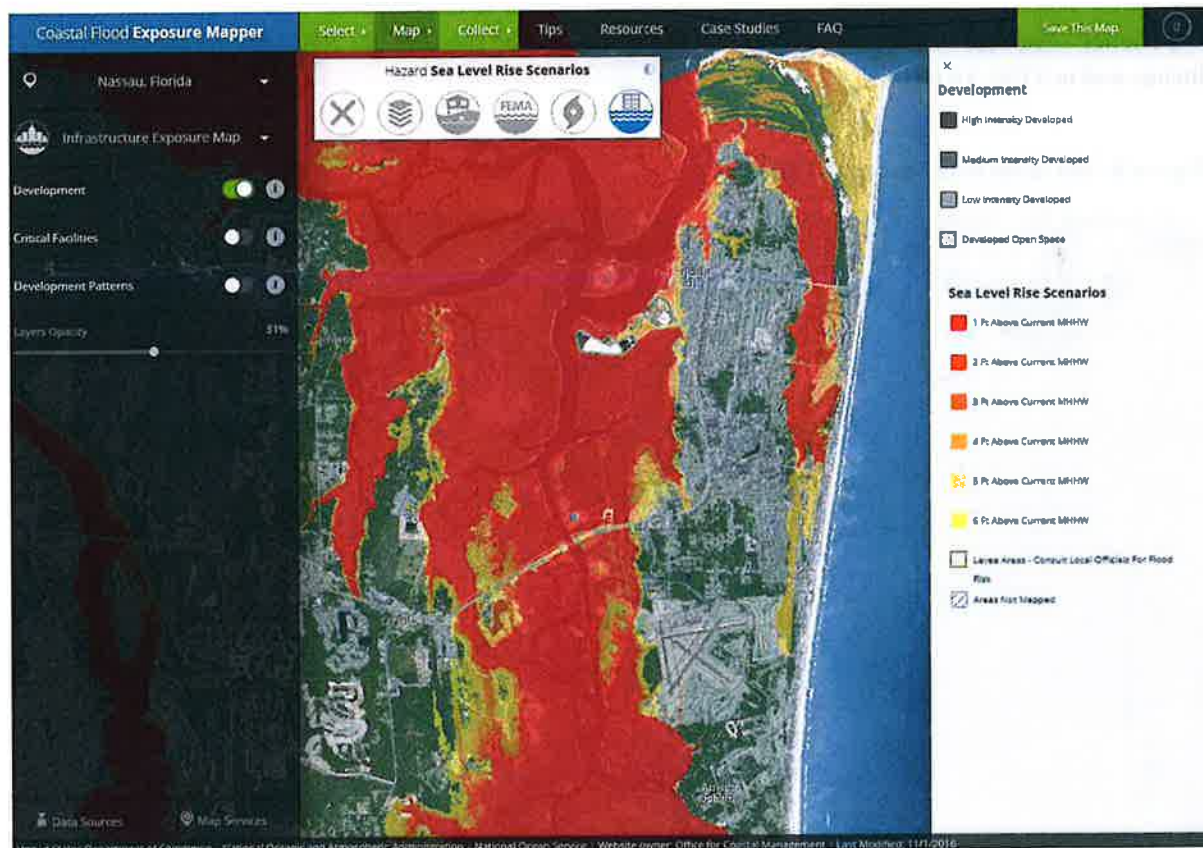
Additionally, the Coastal Flood Exposure Mapper also depicts ‘Societal Exposure’, which includes population density, poverty, elderly populations, employees and projected population growth. The map below (Figure 6) depicts one of those factors, employment.

Figure 6: Employment Population with Sea Level Rise Map



Finally, this tool has the ability to illustrate 'Infrastructure Exposure', which includes development, critical facilities and development patterns. The map below (Figure 7) depicts one of those factors, current development.

Figure 7: Current development with Sea Level Rise



Vulnerable Assets

Utilizing the UF Sea Level Sketch Planning Tool, sea level rise scenarios were assessed for the City of Fernandina Beach. Based on community input from a public meeting held on January 23, 2017 to introduce the community to the tools, the map series below illustrates the US Army Corps of Engineers (USACE) medium projection rate curves for the years 2040 through 2100. Using this projection, there is very little sea level rise projected for the next 100 years. It is projected that in 2060 the City will experience seven (7) inches of sea level rise in some areas of the City. By 2080, the projection is for 12 inches and in 2100, 18 inches.

Figure 8: Sea Level Rise Scenario – 2040



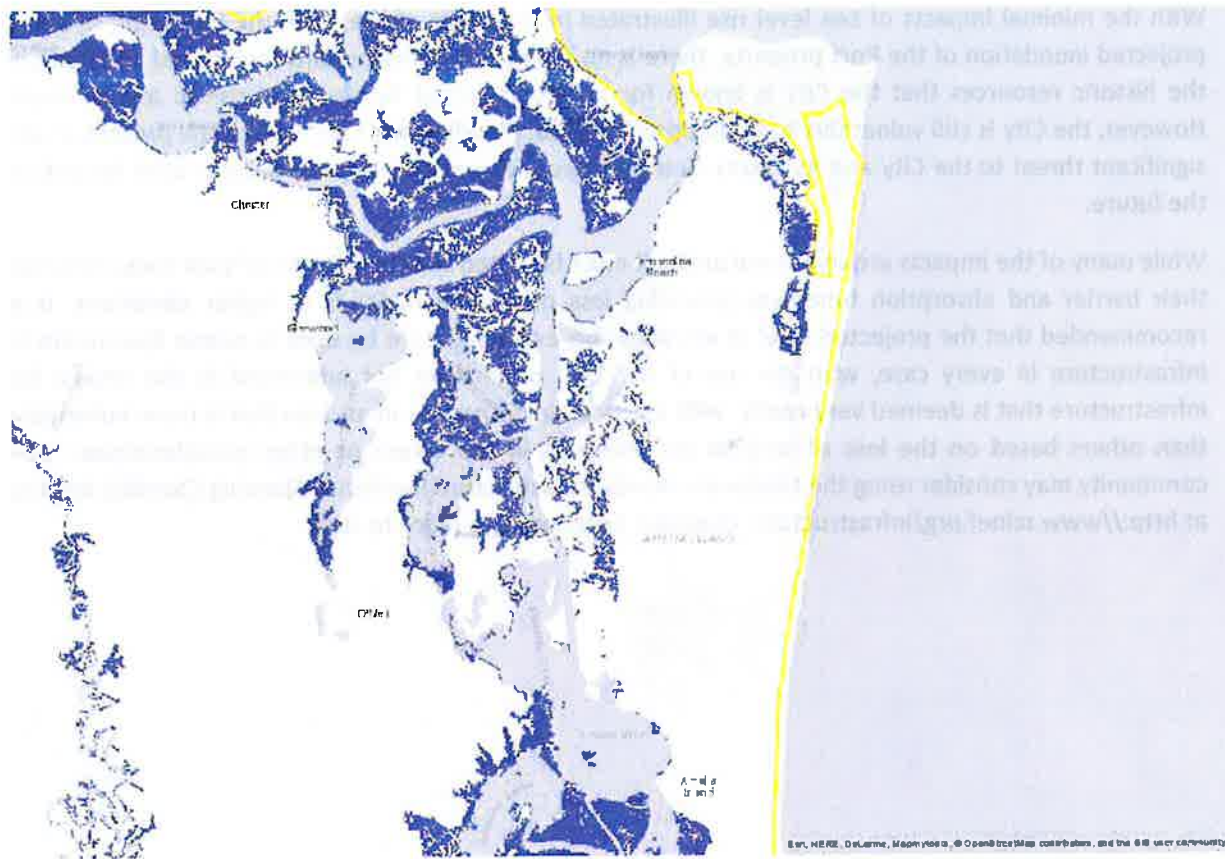
Figure 9: Sea Level Rise Scenario – 2060





This map shows the coastal region of the Iberian Peninsula, specifically the Gulf of Cádiz and the Strait of Gibraltar. The landmass is depicted in light green, while the surrounding waters are in light blue. A prominent yellow line follows the coastline of the Iberian Peninsula. Labels include 'Gulf of Cádiz', 'Strait of Gibraltar', 'Atlantic Ocean', and 'Iberian Peninsula'. The map is oriented with North at the top.

Figure 11: Sea Level Rise Scenario – 2100



Throughout the timeframe assessed, 2040 to 2100, under the USACE medium projection rate curve, the only transportation related asset determined to be vulnerable is the Port of Fernandina. This would include the asset site itself, access to the site, or the area surrounding the property.

Port of Fernandina	
<i>Year</i>	<i>Acres inundated by Sea Level Rise</i>
2040	0.0
2060	0.25
2080	0.48
2100	0.86



Other Considerations

With the minimal impacts of sea level rise illustrated in the maps above, with the exception of some projected inundation of the Port property, there is no significant infrastructure threatened. In addition, the historic resources that the City is known for are not affected by sea level rise in and of itself. However, the City is still vulnerable to flood based hazards. Flooding and storm surge still present a very significant threat to the City and its assets. Sea level rise will exacerbate these flood related hazards in the future.

While many of the impacts are to natural areas, it must be noted that inundation of such areas removes their barrier and absorption functions, providing less protection to lands at higher elevations. It is recommended that the projected level of sea level rise examined here be used to assess investment in infrastructure in every case, with the use of the high projections not addressed in this review for infrastructure that is deemed very costly, with a very long lifespan, or in an area that is more vulnerable than others based on the loss of land to sea level rise in the future or other considerations. The community may consider using the Northeast Florida Infrastructure Resilience Planning Checklist located at http://www.rcinef.org/Infrastructure_Checklist_Form.pdf as a place to start.



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Bringing Communities Together

March 23, 2017

Mr. Jacob Platt
City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

Dear Mr. Platt:

Enclosed is the Vulnerability Assessment for Sea Level Rise for the City of Fernandina Beach. This Vulnerability Assessment was created using online tools, including the NOAA Coastal Flood Exposure Mapper as well as the University of Florida's GeoPlan Sketch Planning Tool. The Vulnerability Assessment provides an understanding of the levels of sea level rise over long-term time horizons and their impacts on City infrastructure. Please note that the assessment, which is based on assumptions and created by tools discussed at the January 23, 2017 public meeting, projects seven inches of rise by 2060, 12 inches by 2080 and 18 inches by 2100. Much of the land impacted by the projected rise is natural areas, and this represents good planning. Please also note that while impacts of sea level rise may not of themselves be extreme, Fernandina Beach remains vulnerable to flooding and storm surge, and the changes brought by sea level rise will exacerbate this vulnerability. See the "Other Considerations" portion of the study for more on this topic.

The City of Fernandina Beach is forward thinking in developing a more specific understanding of the impacts of sea level rise. Your community is to be complemented on consideration of its resilience as it plans for the future. It is hoped that this Vulnerability Assessment assists in guiding future planning and growth initiatives. We hope you will consider a periodic review of the issue as new scientific data becomes available and tools become more robust in the future.

In the meantime, we appreciate everything you do in support of Northeast Florida.

Sincerely,

Brian D. Teeple, AICP
Chief Executive Officer

cc: Commissioner Len Kreger, City of Fernandina Beach
Margo Moehring, NEFRC Managing Director
Elizabeth Payne, NEFRC Director of Emergency Planning Programs

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APPENDIX B

Downtown Waterfront Flooding Assessment



DOWNTOWN WATERFRONT FLOODING ASSESSMENT
FERNANDINA BEACH, FLORIDA

Prepared for:

City of Fernandina Beach, Florida
Stormwater Utility Department
204 Ash Street
Fernandina Beach, FL 32034

Prepared by:

Andre L. Desilet, P.E.
Stormwater Utility Manager
City of Fernandina Beach, FL
204 Ash Street
Fernandina Beach, FL 32034

August 5, 2019

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DRAFT

1.0 Background

Expected future conditions will play a significant role in coastal flooding. Long-term water level changes from sea level rise will affect the extent, frequency, and duration of coastal flooding events. High-tide flooding events that occur only a few times a year now may occur once a month, or once a week. These same water level changes may also increase groundwater levels, which could impact the ability to naturally capture and store rainfall runoff. Changing precipitation regimes in many coastal areas are expected to result in more intense rainfall rates during storms, which may increase the frequency of both rainfall runoff and river flooding. Increased frequencies of these types of flooding events occurring independently increases the chances of these events occurring at the same time.

- **Coastal flooding** occurs in areas directly adjacent to coastal waters. There are several distinct causes:
 - **High-tide flooding** occurs in low-lying coastal areas during extreme high tides (also known as perigean or king tides). These tides occur a few times per year when the sun, moon, and earth align. By definition, a coastal storm is not necessary for high-tide flooding to occur. However, even relatively weak onshore winds can increase the level of flooding.
 - **Storm surge** results from more severe storms such as tropical cyclones (hurricanes and typhoons) and nor'easters, as strong winds drive water onshore. For example, Hurricane Hugo (1989), Hurricane Katrina (2005), and the March 2018 nor'easter generated extensive storm surge. Communities do not have to be directly in or next to the path of a large storm to experience surge effects. Wave setup, an increase in water levels caused by breaking waves offshore (while the storm is approaching the coast), increases the height of storm surges.
 - **Localized wave action** can significantly increase the amount of storm-related flooding and associated damage. Many factors contribute to wave heights , including wind speed and direction, nearshore bathymetry, and land cover near the shoreline. Wave runoff is a significant hazard along steeply sloping shorelines and bluffs. Wave overtopping is the flow of water over the crest of a coastal structure, such as a seawall or dike, due to wave action. In addition to the damage waves can inflict directly on buildings and infrastructure, wave action can erode the shoreline and adjacent uplands.

In addition to episodic flooding events, coastal communities are experiencing long-term water level changes caused by global sea level rise and relative sea level rise.

- **Global (or eustatic) sea level rise** is caused by a change in the volume of the world's oceans due to expansion as the oceans warm, as well as the melting of land-based ice (glaciers and ice sheets).
- **Relative sea level rise** is caused by a combination of global, regional, and local sea level increases caused by regional oceanographic patterns, such as the Atlantic Multidecadal Oscillation, El Niño-Southern Oscillation, hydrologic cycles (river flow), and local or regional vertical land motion (subsidence or uplift).



“Blue-Sky” flooding on North Front Street



Storm Surge flooding on Center St (Hurricane Matthew)

Impacts: Community

Beyond the basic impacts to life and property that flooding can impose on individuals, a stormwater management system impaired by coastal flooding events can have far-reaching effects on the community at large. Minor flood events can disrupt transportation, which affects everything from emergency access to the flow of goods and services, as well as the ability of people to get to and from their homes. Floodwaters that cannot infiltrate or drain may become stagnant, creating additional impacts on human health.

The ability of a community to handle such events is dependent on the frequency of occurrence. Excessive flooding over time, even minor events, can change how people live and how businesses and the community operate. This can cause detrimental economic impacts on real estate values and tourism, and other negative impacts to businesses.

Considerations for Stormwater Management

New approaches are needed as traditional stormwater management infrastructure becomes impaired. In the short term, stormwater levels can be reduced through the introduction of low impact development techniques. Engineered options, such as tide gates, for instance, can prevent backflows from surge events. But these options aren't likely to last for the long term. More expensive and disruptive options, from extensive modifications of existing stormwater practices to the installation of pumps or engineered flood protection structures, may be necessary. In addition, a broader watershed-scale approach to managing stormwater can be employed by engaging land use planners and implementing land development policies and regulations that align community growth and development with stormwater management goals.

Considerations for Floodplain Management

Floodplain managers need to understand how flood hazards are changing and what this means for infrastructure, property, life safety, and environmental resources in their communities' floodplains. In most communities, the flood zones mapped by the Federal Emergency Management Agency (FEMA) form the basis of local floodplain management. Unfortunately, these maps do not reflect stormwater flooding and related infrastructure, nor do they reflect a robust understanding of coastal and precipitation-related flooding happening simultaneously, as can occur during hurricanes and other large coastal storms. That lack of integrated coastal and riverine flood modeling leaves communities with an incomplete picture of how one flooding source may affect the geographic extent or severity of the other.

Similar to the mapping disconnect, floodplain management and stormwater management may be disconnected at the local level if those programs are led by different agencies who must follow

different federal, state, and local requirements. In the absence of integrated mapping and management, floodplain and stormwater managers and planners must work together to devise and implement solutions at both site-specific and watershed scales. These efforts should be responsive to the community's overarching flood risk reduction goals, ordinance requirements, codes, or other legal mandates, as well as any other risk management actions that go above and beyond legal requirements (for example, activities credited under the [National Flood Insurance Program's Community Rating System](#)).

DRAFT

2.0 Assessments

Assessment Parameters:

- **Location:** Fernandina Beach, FL
- **Threshold:** 5ft (NAVD88)
- **Tolerance:** 6 days

The information below is based on your inputs and presents the results of the Quick Flood Assessment Tool as a narrative and data table. The narrative can help you put the data in its proper context and communicate it to your audience. The table provides additional numbers and captures all of the outputs in one location.

Defining the Threshold

Fernandina Beach, FL has a critical flood threshold of 2.26ft Mean Higher High Water (MHHW), which represents the water level at which flooding becomes a problem. Another way to refer to this threshold is 5ft North American Vertical Datum of 1988 (NAVD88), which is the datum for elevation data, surveying, and data like first floor elevations. In addition, these numbers, in meters, are 0.69m MHHW and 1.52m NAVD88.

Changing Return Periods

The current return period for this water level, based on the period of record for Fernandina Beach, FL, is 4 years, which has a 25% chance of occurring or being exceeded once in any given year. In the future, it will take 0.32ft (0.1m) of water level increase from sea level rise to change the current 4 year return period (or 25% per year) to a 2 year (50% per year) return period.

The Threshold Becomes the Norm

As sea level rises, critical thresholds will be reached by the average highest tides (MHHW), causing daily impacts. This will happen sooner under higher sea level rise scenarios.

- Under the Low sea level rise scenario, your critical flood threshold of 2.26ft above MHHW will still be above the future MHHW in 2100.
- Under the Intermediate-Low sea level rise scenario, your critical flood threshold of 2.26ft above MHHW will still be above the future MHHW in 2100.
- Under the Intermediate sea level rise scenario, your critical flood threshold of 2.26ft above MHHW will become the new MHHW in 2069.
- Under the Intermediate-High sea level rise scenario, your critical flood threshold of 2.26ft above MHHW will become the new MHHW in 2054.
- Under the High sea level rise scenario, your critical flood threshold of 2.26ft above MHHW will become the new MHHW in 2046.
- Under the Extreme sea level rise scenario, your critical flood threshold of 2.26ft above MHHW will become the new MHHW in 2042.

NOTE: This analysis is based on sea level rise curves that start in the year 2000. While exact years are given here, the data are more correctly referred to in decadal scales (i.e., "by 2050" instead of "in 2046"). The yearly data were created through a spline interpolation between known decadal data points.

When High Tide Flooding Becomes a Problem

As sea level rises, high tide flooding and the current impacts associated with it will occur more frequently. Currently in Fernandina Beach, FL the high tide flooding threshold is 1.9ft MHHW, which occurs 6 days each year and which may or may not be a problem. At 24 days a year, it does become a problem.

In the future:

- Under the Low sea level rise scenario, high tide flooding will occur 24 or more days a year by 2054.
- Under the Intermediate-Low sea level rise scenario, high tide flooding will occur 24 or more days a year by 2044.
- Under the Intermediate sea level rise scenario, high tide flooding will occur 24 or more days a year by 2031.
- Under the Intermediate-High sea level rise scenario, high tide flooding will occur 24 or more days a year by 2024.
- Under the High sea level rise scenario, high tide flooding will occur 24 or more days a year by 2021.
- Under the Extreme sea level rise scenario, high tide flooding will occur 24 or more days a year by 2020.

NOTE: This analysis is based on sea level rise curves that start in the year 2000.

Significant Flood Events Occurring More Often

Fernandina Beach, FL will also experience a change in the return period of more significant coastal flooding events. Currently, the 1% chance (1 in 100 year) water level is 3.94ft MHHW. With 1.26ft of sea level rise, this 1% chance water level will become the 10% chance (1 in 10 year) water level of 2.67ft MHHW.

- Under the Low sea level rise scenario, the 1% water level becomes the 10% water level after 2086.
- Under the Intermediate-Low sea level rise scenario, the 1% water level becomes the 10% water level after 2065.
- Under the Intermediate sea level rise scenario, the 1% water level becomes the 10% water level after 2043.
- Under the Intermediate-High sea level rise scenario, the 1% water level becomes the 10% water level after 2033.
- Under the High sea level rise scenario, the 1% water level becomes the 10% water level after 2029.
- Under the Extreme sea level rise scenario, the 1% water level becomes the 10% water level after 2026.

NOTE: This analysis is based on sea level rise curves that start in the year 2000. While exact years are given here, the data are more correctly referred to in decadal scales (i.e., "by 2050" instead of "in 2046"). The yearly data were created through a spline interpolation between known decadal data points. In addition, the 1% annual water level values do not necessarily correspond to the base flood elevations defined by the Federal Emergency Management Agency.

Defining the Threshold

Current Threshold (FT MHHW)	Current Threshold (FT NAVD88)	Current Threshold (m MHHW)	Current Threshold (m NAVD88)
2.26	5	0.69	1.52

Changing Return Periods

Current Return Period (years)	Current Return Period (% per year)	Amount of SLR to cause 2-year return (m)	Amount of SLR to cause 2-year return (ft)
4	25%	0.1	0.32

The Threshold Becomes the Norm

Low Scenario (year)	Intermediate-Low Scenario (year)	Intermediate Scenario (year)	Intermediate-High Scenario (year)	High Scenario (year)	Extreme Scenario (year)
MHHW >= Threshold	MHHW >= Threshold	2069	2054	2046	2042

When High Tide Flooding Becomes a Problem

High tide threshold (FT MHHW)		High tide threshold (FT NAVD88)		High tide threshold (m MHHW)		High tide threshold (m NAVD88)					
1.9		4.64		0.58		1.42					
High tide events (days/year)				Planning timeframe (days/year)							
6				6							
Low (days/year, scenario year)		Intermediate-Low (days/year, scenario year)		Intermediate (days/year, scenario year)		Intermediate-High (days/year, scenario year)		High (days/year, scenario year)		Extreme (days/year, scenario year)	
24/2054		24/2044		24/2031		24/2024		24/2021		24/2020	

Significant Flood Events Occurring More Often

1% chance water level (FT MHHW)		1% chance water level (FT NAVD88)		1% chance water level (m MHHW)		1% chance water level (m NAVD88)	
3.94		6.68		1.2		2.04	
10% chance water level (FT MHHW)		10% chance water level (FT NAVD88)		10% chance water level (m MHHW)		10% chance water level (m NAVD88)	
2.67		5.41		0.82		1.65	
Low (year)	Intermediate-Low (year)		Intermediate (year)	Intermediate-High (year)		High (year)	Extreme (year)
2086	2065		2043	2033		2029	2026

Reference Links:

- [NOAA Technical Report NOS CO-OPS 086 - Patterns and Projections of High Tide Flooding](#)
- [NOAA Technical Report NOS CO-OPS 086 - Data: Patterns and Projections of High Tide Flooding \(CSV\)](#)
- [NOAA Technical Report NOS CO-OPS 083 - Global and Regional SLR Scenarios for the U.S.](#)
- [NOAA Technical Report NOS CO-OPS 083 - Data: Global and Regional SLR Scenarios for the U.S. \(CSV\)](#)
- [NOAA Technical Report NOS CO-OPS 067 - Extreme Water Levels of the United States](#)
- [CO-OPS API For Data Retrieval](#)
- [USACE Sea-Level Change Curve Calculator](#)
- [NOAA Sea Level Rise Viewer](#)

3.0 Taking Action

Planning

Comprehensive Plan (or Master Plan or Land-Use Plan)

One of the most impactful plans a community can develop, comprehensive plans express a community's vision for the future. While stormwater and other flood hazard overlays are typically incorporated as inputs, the results frequently show different flooding vulnerabilities for a site. Consolidating the data into a single overlay makes it easier to view the community's flooding vulnerability more holistically and show the potential impacts of various land-use and infrastructure decisions.

Information on how combined flood hazards will change over time should also inform what measures the community considers in its alternatives. Some approaches may mitigate impacts over the short term but lose their efficacy as flooding severity or frequency increases over time. Communities should use the comprehensive planning process to explore when and where managed retreat from the shoreline may be the best approach for managing risk long-term.

Information related to the Peril of Flood Act will be added to the City Comprehensive plan in the 2020 update.

Currently, many comprehensive plan elements address flooding and resiliency, including:

- MMTE Objective 2.11 Waterways
- HE 3.02.04, Objective 3.06 Energy Efficiency and Sustainability
- PFE Objectives 4.02, 4.03, 4.05
- CCME Objectives 5.02, 5.03, 5.04, 5.05, 5.06, 5.07, 5.08, 5.10, 5.11, 5.12, 5.13, 5.14
- ROSE Objectives 6.05, 6.07, 6.10
- ICE Policies 7.01.09, 7.01.10, 7.04.11, 7.04.13
- CIE Generally
- HPE Objective 11.05
- EDE Generally

Capital Improvement Plan

More implementation-oriented than comprehensive plans, capital improvement plans identify specific projects and associated budgets and time frames. Total water levels should be considered in any flood hazard and vulnerability assessment underpinning the capital planning process, particularly for siting and design of transportation assets co-located with stormwater infrastructure. If the capital

plan relies on hazard information or alternatives from other plans or strategies, community planners may need to re-examine those alternatives against total water levels developed.

Recovery or Redevelopment Plan (Pre- or Post-Disaster)

Recovery from a flood or other major disaster often provides communities with an opportunity to address challenges in their stormwater infrastructure and overall flood risk management. FEMA and the American Planning Association developed guidance for recovery or redevelopment planning for both [pre-disaster](#) or [post-disaster](#) situations. In these planning efforts, communities should consider the potential for increased runoff water volume, flow rates, and coastal inundation when reconstructing roads, pipes, and other infrastructure.

Community Area Development Plan

This type of plan identifies issues and options for development (or redevelopment) of a portion of a community—neighborhood, district, or corridor—towards a specific goal, such as waterfront revitalization. Current and future adverse impacts of combined stormwater and coastal flooding should be considered as neighborhoods or commercial districts are targeted for redevelopment.

Flood Damage Prevention Ordinance

Communities adopt and enforce flood ordinances as a condition of participating in [FEMA's National Flood Insurance Program](#). At a minimum, communities must regulate development in the 100-year floodplain as designated on FEMA flood maps. While these maps consider flooding from rivers and coastal water bodies, they typically do not reflect stormwater hazards, nor do they consider future flooding caused by sea level rise or other climate impacts.

Some communities have successfully integrated FEMA floodplain management requirements with their stormwater regulations. [The City of Ocala, Florida developed maps](#) that combine FEMA inland flood zones and stormwater hazards, which form the basis of their flood ordinance. Similarly, [Pinellas County, Florida's flood ordinance](#) applies to flood zones shown on FEMA's maps (inland and coastal hazards) and flood-prone areas mapped in its local stormwater management plan and drainage basin study.

Whether implemented independently or integrated with stormwater management, communities should review the effectiveness of their existing floodplain regulations, codes, and standards in light of the potential future impacts of total water levels. They should answer questions such as these:

1. Does any community-wide freeboard need be increased to account for combined flood hazards and future conditions (both rainfall runoff and sea level rise)?
2. Are design flood elevations or flow volumes for new or repaired infrastructure adequate to prevent damage or loss of service due to the combined flooding expected over its expected service life?

On-the-Ground Measures

Effectively managing stormwater requires a well-designed system that is regularly monitored and maintained. More frequent or severe coastal flooding can adversely affect structural system components (including both “gray” and “green” infrastructure elements) and their operation in many ways:

- Structural damage or partial-to-complete submergence of outfalls, pumps, and other infrastructure, either intermittently during coastal storms or permanently due to sea level rise

- Saltwater backflow into outfall pipes, storm drains, and pumps
- Corrosion or other decay of equipment not designed for saltwater exposure
- Increased demand on pumps to compensate for decreased vertical gradient between stormwater collection points and outfall sites
- Increased influx of sand and other coastal sediments clogging system components
- Changes in salinity that lead to undesirable changes in vegetation in wet ponds or other green infrastructure, such as die-off or diminished performance of native species or encroachment by invasive species
- Diminished function or reduced capacity of underground storage, infiltration, and retention features due to rising groundwater tables

Stormwater system vulnerabilities revealed in [“Analyze Stormwater Systems”](#) will drive communities to plan and implement a wide array of measures on the ground so their systems provide the desired level of service. Most measures fall into one or more of these overarching strategies:

- **Holding Back the Sea:** Preventing higher coastal flood levels from reaching assets
- **Living with the Sea:** Expecting some coastal flooding on a temporary basis
- **Reducing or Slowing Rainfall Runoff:** Decreasing expected runoff volumes or flow rates
- **Moving Stormwater More Efficiently:** Increasing the stormwater system’s capacity to hold and move water

This section provides examples of on-the-ground measures and best management practices (BMPs) that communities are considering across these overarching strategies. Which measures will be effective or implementable will depend on [many considerations](#), as well as on how consistent they are with [community plans](#); [regulations, standards, and guidance](#); and [available funding](#).

Holding Back the Sea

Communities have a range of measures to help them protect existing stormwater infrastructure from coastal flooding and damage caused by flood-related wave action, erosion, sedimentation, or saltwater exposure. These measures range from large-scale civil engineering works designed to protect entire communities or large parcels, to small-scale, site-specific features intended to protect specific assets or functions:

- **Tidal or surge barriers** are physical floodgates constructed in the water at inlets, rivers, or other narrow breaks in the coastline that, when closed, can prevent high tides or storm surges from traveling inland.
- **Sand dunes, wetlands, and other natural or nature-based infrastructure** are physical barriers that can protect communities or specific properties from floodwaters or attenuate high-velocity flow and wave action. To learn more about green infrastructure and how it can be used to build flood resilience, check out some of [NOAA's Digital Coast resources](#) (particularly the [training](#), [quick reference](#), and [effectiveness database](#)), resources from the [EPA](#), and the [U.S. Army Corps of Engineers' Engineering with Nature program](#).
- **Levees, seawalls, revetments, and other floodwalls** are designed to block floodwaters from inundating communities, individual properties, or specific buildings or machinery, such as pump stations. Among the considerations for use of these barriers are the design flood levels, which should consider combined total water levels over its service life, and impacts on adjacent coastal properties, public beaches, and other natural resources.
- **Dry flood-proofing** can prevent water from entering specific nonresidential buildings or specific machinery through the use of sealed exterior walls, watertight doors, and water-resistant materials. The risks of coastal floods that exceed the design flood elevation must be considered carefully along with the need for evacuation of personnel.

- **Backflow prevention devices**, such as gates, check valves, and duckbills, can prevent saltwater intrusion and tidal backflow from penetrating stormwater pumps and pipes.

Living with the Sea

Other measures allow for intermittent or temporary inundation of system components without inflicting damage or hindering performance. One such approach is wet flood-proofing, where buildings or machinery are designed to allow floodwaters to passively enter and exit. For example, while traditional suction lift and dry well pumps will typically fail when flooded, submersible pump stations are designed to operate underwater and thus can provide communities with critical operational capacity and greater resilience to flooding. As with dry flood-proofing, communities contemplating wet flood-proofing approaches for their stormwater facilities should consider the impacts of coastal flooding that exceeds the design flood elevation or expected flood duration. Depending on projected coastal total water levels and the rate that they may increase over time, these measures may only delay the inevitable—the frequency or severity of flooding may become so great that none of the measures here or in “Holding Back the Sea” remain effective. The time frame over which these measures are expected to be effective is a [critical dimension of planning](#), particularly given the potential costs and long lead times for capital improvements. Once those approaches are no longer viable, managed retreat from the shoreline and relocation of assets become important options for your overall strategy.

Reducing or Slowing Rainfall Runoff

Measures for decreasing the volume or flow rate of rainfall range from landscape scale—such as [open space preservation](#), [urban forestry](#), or [park and other public land management](#)—to site-specific practices, such as BMPs. Which approach, or combination of approaches, your community needs will depend on the geographic scope and severity of your current and future stormwater management challenges. While the balance of this section focuses on site-specific measures, the links above provide some representative resources for larger-scale efforts.

Many of the BMPs and low-impact development approaches that communities use to improve water quality, including measures required under their NPDES permit, may help reduce the volume or flow rate of runoff delivered to and moving through the stormwater system, particularly for smaller rainstorms, such as 1- or 2-year events. Examples include grass swales, vegetated filter strips, wet ponds, dry ponds, green roofs, permeable pavements, and subsurface detention reservoirs. Learn more about these approaches:

- EPA’s [Stormwater Management Best Practices Design Guide](#)
- EPA’s [National Menu of Best Management Practices](#)
- EPA’s [Green Infrastructure Program](#)
- EPA’s [Green Infrastructure Modeling Toolkit](#)
- NOAA and EPA’s [Management Measures](#)
- Resources from the [Low Impact Development Center](#)
- NOAA’s [green infrastructure resources](#)

Communities considering these measures should be aware that coastal inundation from storms and sea level rise, as well as rising groundwater tables, may adversely affect their short-term or long-term efficacy. For example, higher groundwater tables may diminish the performance of infiltration features or subsurface reservoirs, while vegetation used in wet ponds or restored wetlands may need to be changed to better tolerate exposure to salt via wind or water.

Moving Stormwater More Efficiently

Communities have options for increasing the capacity of their stormwater systems to collect and convey runoff and deliver it to the final receiving body—the tidal river, bay, or ocean. Such options include

- Installing larger pipes and appropriately upsizing culverts to convey anticipated higher rainfall runoff volumes
- Maintaining drainage ditches (in rural areas) and pipes (in urban settings) to convey anticipated higher rainfall runoff volumes
- Raising stormwater system inlets to increase gravity flow from outlets
- Installing pumps to force water out when tidal flooding inhibits gravity-based discharges from outlets
- Adding additional conveyance and treatment capacity to account for future capacity decreases and service interruptions due to flood events
- Installing more detention and retention ponds to control release of runoff to receiving water body



APPENDIX C

Downtown Waterfront Sea-level Rise Study



DOWNTOWN WATERFRONT SEA LEVEL RISE STUDY
FERNANDINA BEACH, FLORIDA

Prepared for:

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Stormwater Utility Department
204 Ash Street
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Prepared by:

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Stormwater Utility Manager
City of Fernandina Beach, FL
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August 5, 2019

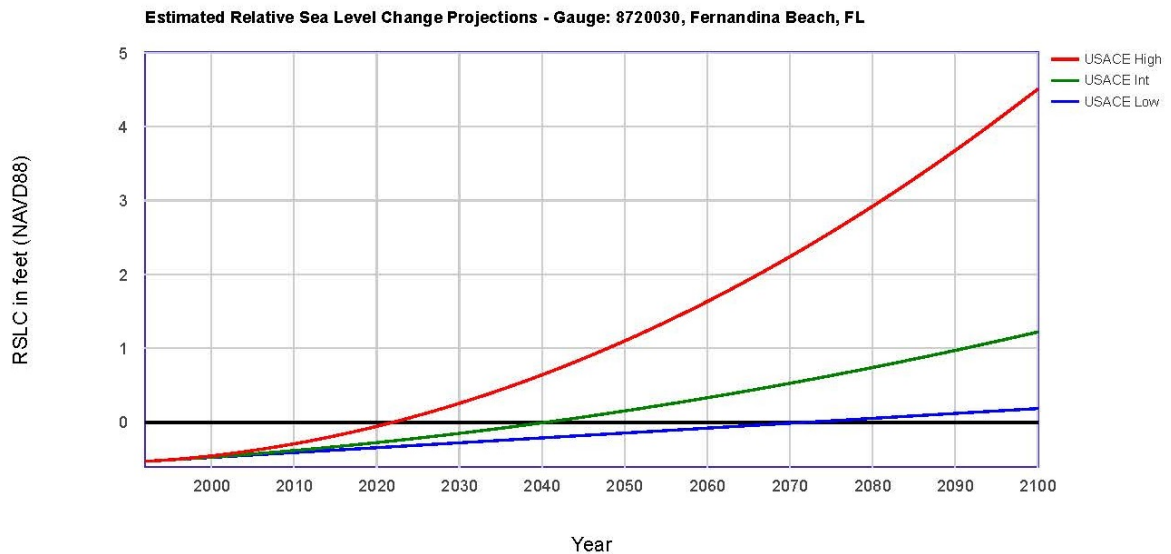
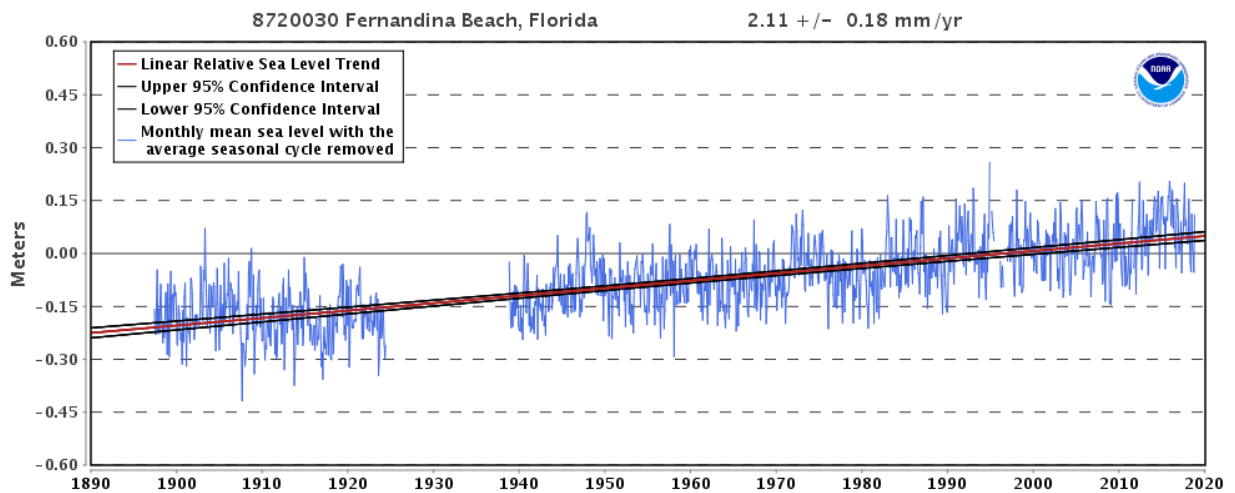
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1.0 Background

In an effort to increase the awareness of Sea Level Rise and further planning to increase resilience along the Fernandina Beach Downtown Waterfront, this report is intended to summarize available information and projections to establish design standards and planning objectives in this area.

Historical trends provide valuable data regarding global Sea Level Rise (SLR), but recent studies suggest an increase of the rate and magnitude of SLR. Scenarios do not predict future change, but describe potential future conditions in a manner that supports planning. The studies predict with confidence that global mean SLR will rise at least 8 inches, and no more than 6.6 feet by the year 2100. The scenarios presented in this report reflect the range of predictions and the impact on the Fernandina Beach Waterfront. Additional information concerning these projections can be found in *Global Sea Level Rise Scenarios for the United States National Climate Assessment*.



A tide station operated by the National Oceanic and Atmospheric Administration (NOAA) is located on a dock along the Fernandina Beach waterfront near the end of Calhoun Street. This station (#8720030) has been monitored since May 1897. All measurements and projections are specific to this station.



NOAA Tide Station #8720030, Fernandina Beach, FL

2.0 Assessment Tools

The University of Florida GeoPlan Sea Level Scenario Sketch Planning Tool was utilized to help visualize the impact to the Fernandina Beach Waterfront of the various projections for SLR. The following figures show the effects of the projected SLR scenarios for 2040 and 2100.

USACOE 2040 Low SLR Projection



August 5, 2019

SLR Depth Inches (2040 C1)

High : 41



Low : 0



RSLR by County (2040 C1)

Roads (2040 C1)

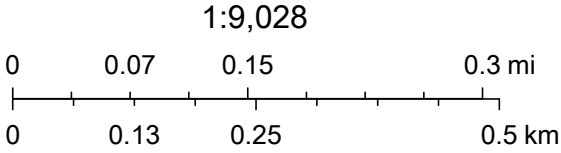
< 10%

10% - 24%

25% - 49%

50% - 100%

Coastal Areas Mapped



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACOE 2040 Intermediate SLR Projection



August 5, 2019

SLR Depth Inches (2040 C2)

High : 44



Low : 0



RSLR by County (2040 C2)



Roads (2040 C2)



< 10%



10% - 24%



25% - 49%

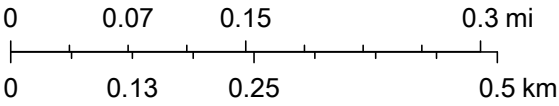


50% - 100%



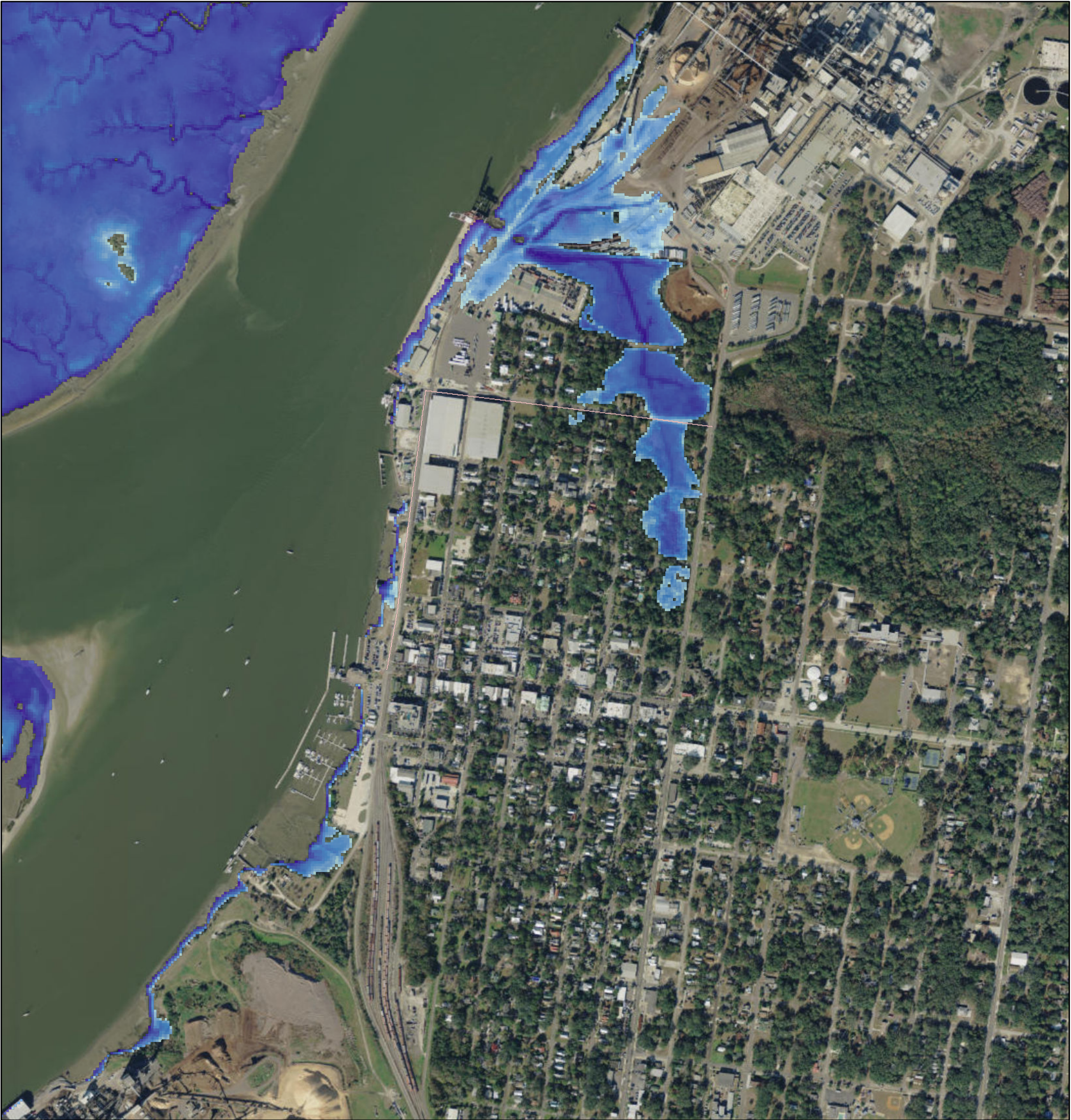
Coastal Areas Mapped

1:9,028



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACOE 2040 High SLR Projection



August 5, 2019

SLR Depth Inches (2040 C4)

High : 52



Low : 0



RSLR by County (2040 C4)

Roads (2040 C4)



< 10%



10% - 24%



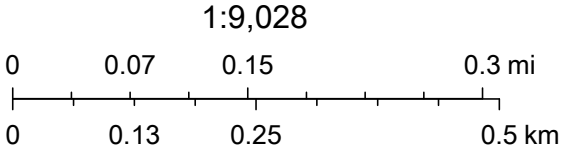
25% - 49%



50% - 100%



Coastal Areas Mapped



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACOE 2100 Low SLR Projection



August 5, 2019

SLR Depth Inches (2100 C1)

High : 118



Low : 0



RSLR by County (2100 C1)



Roads (2100 C1)



< 10%



10% - 24%



25% - 49%

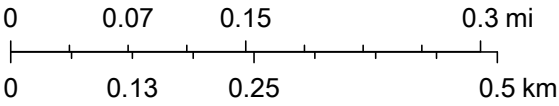


50% - 100%



Coastal Areas Mapped

1:9,028



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACOE 2100 Intermediate SLR Projection



August 5, 2019

SLR Depth Inches (2100 C2)

High : 58

Low : 0

RSLR by County (2100 C2)

Roads (2100 C2)

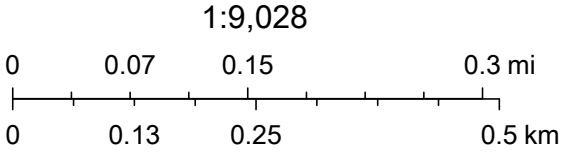
< 10%

10% - 24%

25% - 49%

50% - 100%

Coastal Areas Mapped



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACOE 2100 High SLR Projection



August 5, 2019

SLR Depth Inches (2100 C4)

High : 98

Low : 0

RSLR by County (2100 C4)

Roads (2100 C4)

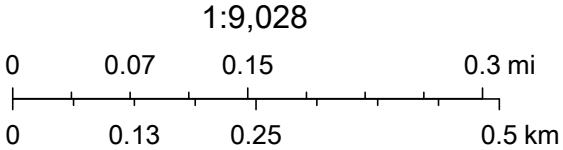
< 10%

10% - 24%

25% - 49%

50% - 100%

Coastal Areas Mapped



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

3.0 Conclusion

The simulations show the extent of currently dry ground that would be inundated by each projected SLR scenario. While the area is minimal along the Fernandina Beach waterfront, the projected SLR will contribute to increased flooding when combined with annual high tide events and storm surge. Base on this evaluation, adopting the USACOE Intermediate SLR projection for planning purposes is a reasonable approach. This projection indicates a SLR of 1.75' by the year 2100.

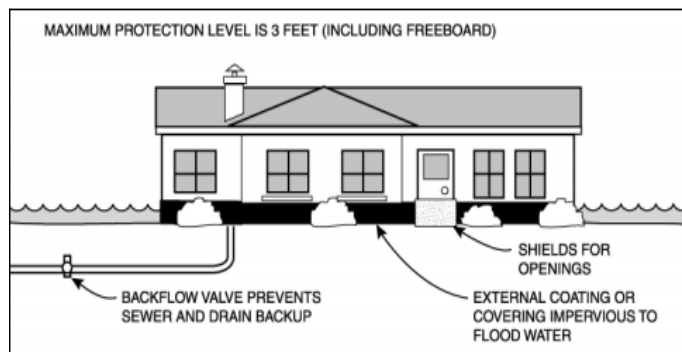


APPENDIX D

Adaptation Strategies Summary Sheets

ADAPTATION STRATEGY

NO. 1 DRY FLOOD-PROOFING



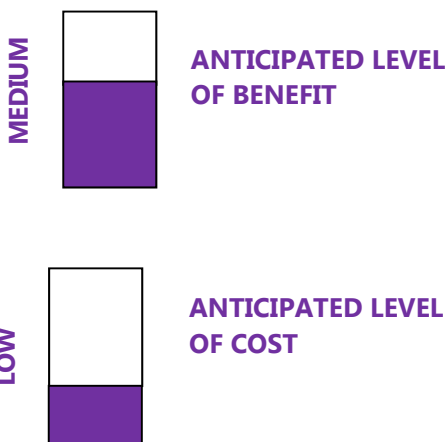
Source: FEMA Chapter 7 Dry Flood-Proofing. www.fema.gov

DESCRIPTION

Installation of waterproof coatings, supplemental masonry or concrete, shields, and sewage backflow valves as required to prevent in-flow of water below expected flood level of a given structure.

PROJECT SCOPE

- ☐ Site Specific
- ☒ Broader Planning Area



SHOCKS ADDRESSED

- ☒ Flooding (Storm Surge)
- ☒ Severe Storms
- ☐ Heat Waves
- ☐ Infrastructure/Building Failure
- ☒ Disease Outbreaks

STRESSES ADDRESSED

- ☒ Flooding (King Tide/Sea Level Rise)
- ☐ Aging Infrastructure
- ☐ Mobility

APPLICABILITY

Vulnerability: Flooding (high-tide, storm surge related, or sea level rise flooding)

Assets: Structures

Dry flood-proofing can help to protect individual structures from floodwater intrusion. Flood-proofing lower levels of structures can potentially extend the life of buildings by preventing excess exposure to water/corrosion damage.

IMPLEMENTATION

Dry flood-proofing techniques can be applied on a structure-by-structure basis and adjusted to meet the needs of each structure.

ANTICIPATED CO-BENEFITS

- ❖ Increased property values by adding additional flood protection
- ❖ Potentially lower flood insurance rates where applicable
- ❖ Focusing on resiliency of historically unique structures contributes to a sense of community and motivation to work towards the goal of making the City more resilient
- ❖ Sewage backflow valves prevent raw sewage from flooding homes and businesses

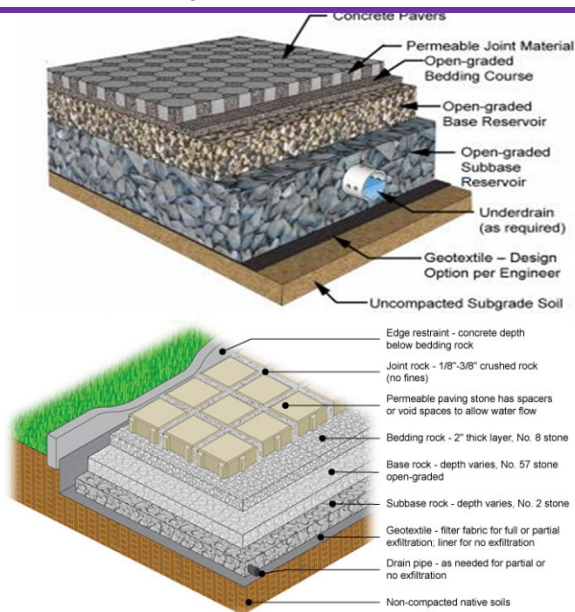
REFERENCES

Source: FEMA CH. 7 Dry Floodproofing

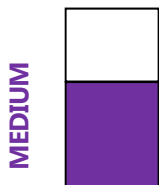
URL: https://www.fema.gov/media-library-data/20130726-1608-20490-9182/fema_551_ch_07.pdf

ADAPTATION STRATEGY

NO. 2 PERVIOUS, PERMEABLE OR POROUS PAVERS



**ANTICIPATED LEVEL
OF BENEFIT**



**ANTICIPATED LEVEL
OF COST**

SHOCKS ADDRESSED

- ✓ Flooding (Storm Surge)
- ✓ Severe Storms and Extreme Rainfall
- ✓ Heat Waves
- ✓ Infrastructure/Building Failure
- Disease Outbreaks

STRESSES ADDRESSED

- ✓ Flooding (King Tide/Sea Level Rise)
- ✓ Aging Infrastructure
- ✓ Mobility

DESCRIPTION

These types of alternate pavers allow water to filter either through the pavement itself or between the joints of pavers. The strategy proposes to replace completely impervious surfaces (asphalt, concrete, etc.) with pavement systems that allow water to infiltrate into the subsurface.

PROJECT SCOPE

- Site Specific
- ✓ Broader Planning Area

Figure Source: Vision Design Collaborative (Below) Alliance for the Bay (Above)

APPLICABILITY

Vulnerability: Standing floodwaters impeding mobility

Assets: Transportation Infrastructure

This strategy will contribute to decreasing the amount of standing water within the Downtown Waterfront Area in the event of a storm or tidal flood event. If implemented in and around problem areas, accumulated floodwaters will have an additional outlet through which to drain as waters recede. The strategy can potentially help with mobility recovery after the shock of storm surge, and chronic stress due to high tide flooding by clearing the roads of water more quickly. This strategy is applicable where impermeable surfaces already exist. Green spaces will always provide more opportunities for water drainage than paved surfaces.

IMPLEMENTATION

The strategy can be applied to an individual site such as a parking lot or event area or could be implemented at a larger scale such as public roadways, as appropriate. Pavers are not appropriate for high-volume or high-speed roads.

ANTICIPATED CO-BENEFITS

- ❖ Less direct runoff to Amelia River via contaminants filtering out through the permeable paver and earth below
- ❖ Pleasing aesthetic over traditional paved surfaces
- ❖ Traffic calming mechanism, drivers tend to drive slower over pavers as compared to asphalt or concrete
- ❖ Reduced dust when compared to gravel parking lots

REFERENCES

Alliance for the Bay.org: Reduce Your Stormwater

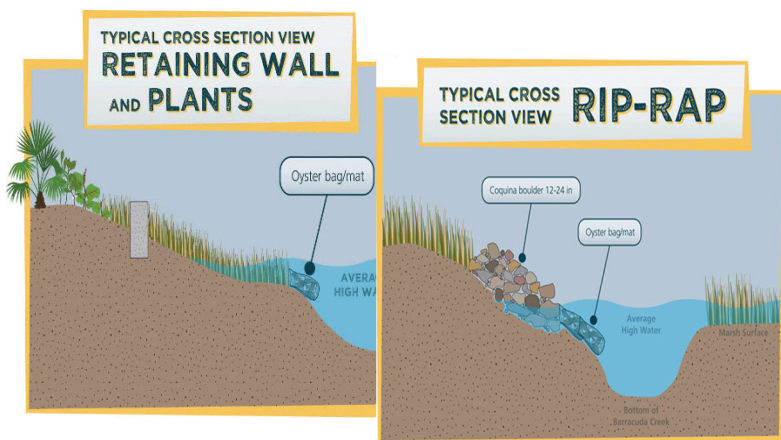
URL: <http://www.stormwater.allianceforthebay.org/take-action/installations/perVIOUS-pavers>

Vision Design Collaborative - Blog

URL: <http://vdcgreen.blogspot.com/2010/09/permeable-pavement-systems-just.html>

ADAPTATION STRATEGY

NO. 3 SHORELINE STABILIZATION



DESCRIPTION

Addressing scour and erosion on properties adjacent to the marina seawall will protect these properties from the effects of water intrusion and eliminate a weak point of intrusion along the Fernandina waterfront. Engineered stabilization of the entire shoreline is necessary to limit the impact of chronic flooding as well as dissipate energy during major storm events. Shoreline stabilization may include green to gray options such as a living shoreline, riprap revetment or other energy dissipating technology, or seawall extension.

PROJECT SCOPE

- ☐ Site Specific
- ☒ Broader Planning Area

APPLICABILITY

Vulnerability: Flooding (high tide, storm surge related, or sea level rise)

Assets: Upland (fill) and Upland Structures

This strategy will prevent further erosion of the shoreline, and inflow of water in areas where the shoreline has already been compromised. An engineered riprap revetment or seawall includes properly graded backfill and geotextile fabric to allow for drainage without loss of fill. In a post-flood event, these structures will allow water to infiltrate back into the Amelia River. Shoreline stabilization structures also reflect waves during a storm event instead of breaking and dissipating upland. Living shorelines offshore, or engineered vegetated shorelines are greener options (compared to hardened shorelines) which also serve to dissipate wave energy and minimize the effects of wave-induced shoreline erosion.

IMPLEMENTATION

Shoreline stabilization strategies vary and can be applied to existing structures (e.g., additions, repairs, and retrofits), or incorporated into new design of waterfront properties.

ANTICIPATED CO-BENEFITS

- ❖ Can be designed to create habitat for aquatic species
- ❖ Potential viewshed improvement, and safe public access to the waterfront depending on the chosen strategy
- ❖ Prevents direct stormwater runoff by installing proper filtered drainage behind stabilization structures, which can improve water quality along the shoreline.

REFERENCES

Site: Florida Living Shorelines

URL: <http://floridalivingshorelines.com/types-of-living-shorelines>

HIGH



ANTICIPATED LEVEL
OF BENEFIT

HIGH



ANTICIPATED LEVEL
OF COST

SHOCKS ADDRESSED

- ☒ Flooding (Storm Surge)
- ☒ Severe Storms and Extreme Rainfall
- ☐ Heat Waves
- ☒ Infrastructure/Building Failure
- ☐ Disease Outbreaks

STRESSES ADDRESSED

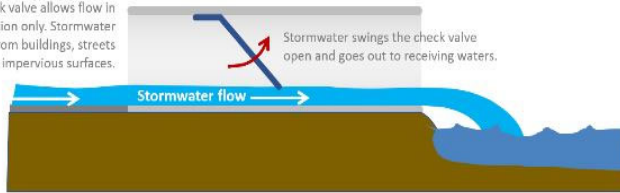
- ☒ Flooding (King Tide/SLR)
- ☒ Aging Infrastructure
- ☒ Mobility

ADAPTATION STRATEGY

NO. 4 TIDAL VALVES

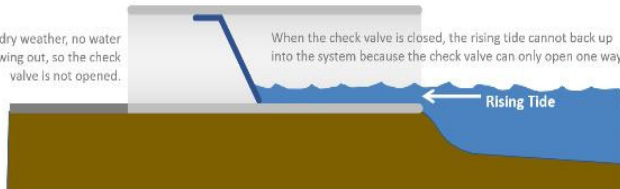
HOW DOES AN IN-LINE CHECK VALVE WORK?

An in-line check valve allows flow in one direction only. Stormwater flows away from buildings, streets and other impervious surfaces.



Stormwater swings the check valve open and goes out to receiving waters.

During dry weather, no water is flowing out, so the check valve is not opened.



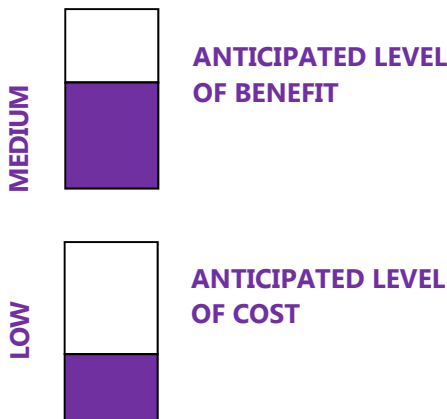
When the check valve is closed, the rising tide cannot back up into the system because the check valve can only open one way.

DESCRIPTION

A tidal valve typically consists of an engageable seal installed on a drainage outfall to allow for flow of water in one direction, and prevent flow in the opposite direction. Tidal valves such as the Tideflex Checkmate® valves can be installed to prevent upland in-flow of water during flood events, while still allowing for drainage of inundated areas as flood waters recede.

PROJECT SCOPE

- ☐ Site Specific
- ☒ Broader Planning Area



APPLICABILITY

Vulnerability: Flooding (high tide, storm surge related, or sea level rise flooding)

Assets: Roadways, historic structures, buildings

This strategy will help prevent the inflow of water onto city streets as water levels rise, protecting upland structures and infrastructure. The strategy also provides a pathway for drainage of water as flood waters recede. Tidal valves can be applied to stormwater drainage pipelines leading from roadways. Valves also prevent odors from migrating up the pipeline to public areas and prevent wildlife from entering the pipeline at the outfall location.

IMPLEMENTATION

Appropriate as add-on to existing site or asset vs appropriate for redevelopment or rebuilding of site or asset (could be one, the other, or both). Existing stormwater drains can be retrofitted with tidal valves of appropriate size, at a relatively low cost. The adaptation strategy is also recommended for new development of stormwater drainage systems.

ANTICIPATED CO-BENEFITS

- ❖ Properly designed and maintained stormwater drainage systems mitigate mobility issues caused by flooding of public roads
- ❖ Public health is maintained when water drains properly from public infrastructure, and when sewage is discharged and treated effectively
- ❖ Tidal valves and properly installed grates prevent marine mammals from being trapped or sucked into larger outfall pipes

REFERENCES

Site: Charleston SC Gov

URL <https://www.charleston-sc.gov/1995/Check-Valve-Program>

SHOCKS ADDRESSED

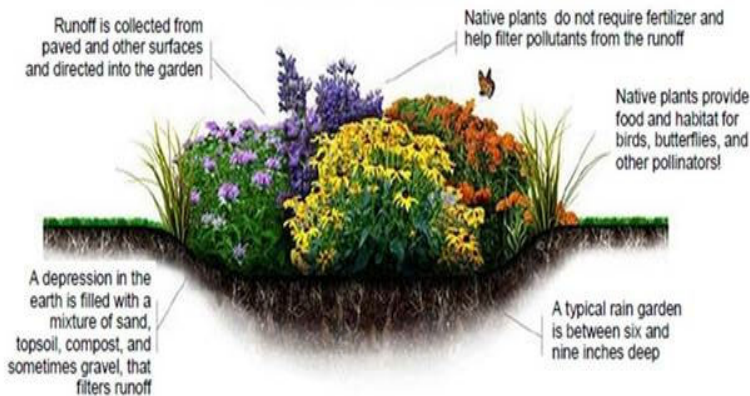
- ☒ Flooding (Storm Surge)
- ☒ Severe Storms
- ☐ Heat Waves
- ☒ Infrastructure/Building Failure
- ☐ Disease Outbreaks

STRESSES ADDRESSED

- ☒ Flooding (King Tide/Sea Level Rise)
- ☒ Aging Infrastructure
- ☒ Mobility

ADAPTATION STRATEGY

NO. 5 UPSTREAM STORMWATER GREEN INFRASTRUCTURE



MEDIUM



ANTICIPATED LEVEL OF BENEFIT

LOW



ANTICIPATED LEVEL OF COST

SHOCKS ADDRESSED

- ☒ Flooding (Storm Surge)
- ☒ Severe Storms
- ☒ Heat Waves
- ☒ Infrastructure/Building Failure
- ☐ Disease Outbreaks

STRESSES ADDRESSED

- ☒ Flooding (King Tide/Sea Level Rise)
- ☒ Aging Infrastructure
- ☒ Mobility

DESCRIPTION

This strategy covers a variety of small-scale water retention and containment practices that can be implemented upland of the waterfront area. Stormwater retention and infiltration can be promoted by the installation of curb cutouts, green spaces, upgrades to existing swales, stormwater ditches, and debris catchers over storm drains.

PROJECT SCOPE

- ☐ Site Specific
- ☒ Broader Planning Area

APPLICABILITY

Vulnerability: Flooding (high tide, storm surge related, or sea level rise flooding).

Assets: Roadways, historic structures, buildings

This strategy is aimed at combating the acute shock of heavy rain during severe storm events, which results in the sustained flooding of city streets. Increasing green spaces, and temporary water retention areas will divert flood waters from roadways and buildings while allowing for infiltration as flood waters recede.

IMPLEMENTATION

Stormwater retention areas should be included in any new development, especially where green spaces are proposed to be cleared and hardened. Small-scale concepts of this strategy are appropriate for retro-fitting existing infrastructure. Maintenance of all upland stormwater controls is key to the success of this strategy.

ANTICIPATED CO-BENEFITS

- ❖ Providing alternate low-elevation areas for water retention allows for waters to accumulate in retention areas before flooding city streets. This strategy mitigates mobility issues caused by standing water on public roads during storm events.
- ❖ Turning traditional stormwater drainage swales/ditches to a bioswale with native vegetation will not only retain more water, but will add an element of beauty to public spaces, and provide habitat and food for native species (birds, butterflies, etc.)
- ❖ Diverting flood waters away from homes, historic structures, and infrastructure alleviates structural burdens caused by flooding.

REFERENCES

Florida Adaptation Planning Guidebook

United Storm Water, Inc.

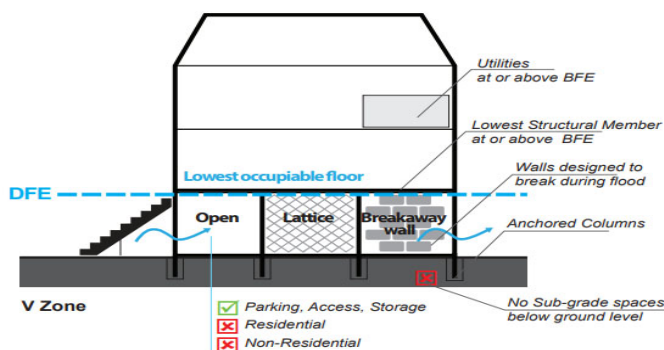
URL: <http://unitedstormwater.com/screenCovers.php>

Royal Oak, Rain Garden Program

URL: <https://www.romi.gov/1333/How-Rain-Gardens-Work>

ADAPTATION STRATEGY

NO. 6 WET FLOOD-PROOFING



Source: FEMA 8.1 Enclosures and Breakaway Walls
Home Builder's Guide to Coastal Construction
www.fema.gov

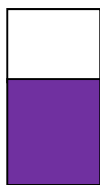
DESCRIPTION

Wet floodproofing includes permanent or conditional measures applied to a structure that allows floodwaters to enter at controlled points, thereby minimizing damage to the structure caused by sustained hydrostatic forces applied to the exterior of the structure.

PROJECT SCOPE

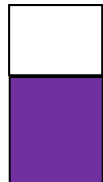
- ☐ Site Specific
- ☒ Broader Planning Area

MEDIUM



ANTICIPATED LEVEL
OF BENEFIT

MEDIUM



ANTICIPATED LEVEL
OF COST

SHOCKS ADDRESSED

- ☒ Flooding (Storm Surge)
- ☒ Severe Storms
- ☐ Heat Waves
- ☒ Infrastructure/Building Failure
- ☐ Disease Outbreaks

STRESSES ADDRESSED

- ☒ Flooding (King Tide/Sea Level Rise)
- ☐ Aging Infrastructure
- ☐ Mobility

APPLICABILITY

Vulnerability: Flooding (high-tide, storm surge related, or sea level rise flooding)

Assets: Structures

- ❖ Wet flood-proofing can help to protect individual structures below Base Flood Elevation (BFE) from floodwater damage by utilizing materials and techniques designed to allow the even flow in and flow out of floodwaters.
- ❖ Utilizing materials that are flood and moisture resistant in the lower levels of structures can potentially extend the life of buildings by preventing excess exposure to water/corrosion damage.
- ❖ Raising and/or waterproofing utility infrastructure within structure reduces the chance that it will have to be replaced, saving the owner money and shortening the disruption of service – possibly preventing it all together.
- ❖ Wet flood-proofing techniques can be applied on a structure-by-structure basis and adjusted to meet the needs of each structure, before or after remodeling due to flood damage.
- ❖ Allowing the passing, instead of blocking, of floodwaters could reduce the pressure on structures and foundations during a flooding event.

IMPLEMENTATION

Existing structures can be retrofitted with wet floodproofing techniques, though this can prove costly depending on the first-floor elevation. Wet floodproofing techniques are best suited for the planning stages of new development.

ADAPTATION STRATEGY

NO. 6 WET FLOODPROOFING

ANTICIPATED CO-BENEFITS

- ❖ Increased property values by adding additional flood protection
- ❖ Potentially lower flood insurance premium rates for non-residential structures, where applicable. (Note: premium rates can only be reduced through elevation of a residential structure above the base flood elevation)
- ❖ Focusing on the resiliency of historically unique structures contributes to a sense of community and motivation to work towards the goal of making the City more resilient

REFERENCES

Selecting Appropriate Mitigation Measures for Floodprone - FEMA CH. 7 Dry Floodproofing

URL: https://www.fema.gov/media-library-data/20130726-1608-20490-9182/fema_551_ch_07.pdf



APPENDIX E

Resilience Scorecard Project Evaluation Criteria

City of Fernandina Beach

Resiliency Scorecard Project Evaluation

Evaluation Criteria	Description
Resilience Evaluation Criteria	
Reliability	Likelihood of disruption of service due to shocks and stresses. Considers capability of infrastructure project to maintain operations under a range of conditions. For example, likelihood a road will be passable during a severe storm; ability of electrical cabling to operate in extremes of heat and cold.
Resistance	Likelihood of damage or impacts due to shocks and stresses. Considers direct physical protection of the infrastructure project. For example, likelihood a road would be damaged by a severe storm, inclusion of flood defenses.
Recovery of Assets	Cost to resume service following exposure to shocks/ stresses. Considers ability to recover from disruption. Will there be costs associated with getting the infrastructure back in service following a shock/stress?
Redundancy	Ability to continue service during exposure to shocks/ stresses even with some damage or impacts to the infrastructure. Considers adaptability of the assets or networks or systems that are part the project. Could include a back up or alternate system. For example, ability to maintain service during severe storm without interruption (i.e. having a backup generator for pump station; installation of backup data centers)
Benefits Evaluation Criteria	
Benefit-Cost Ratio	Calculated by a project's total benefits divided by its total costs.
Moderation of shocks/stresses on assets within the Downtown Waterfront Area	Does the project cause or allow for moderation of impacts of shocks and stresses? For example, stormwater project that moderates impact of flooding on roads.
Integration of green infrastructure or environmental benefits	Project design incorporates green infrastructure or includes new environmental benefits .
Integration of historic preservation	Project design incorporates historic preservation considerations. For example: increases level of protection of a historic resource or asset.
Integration of social benefits	Project design considers social benefits and/or social equity. For example: enhancement, new resource, or increases affordability or protection of vulnerable populations.
Integration of mobility considerations	Project design incorporates mobility issues. Includes considerations such as: railroad safety integration, carrying capacity, population. Also, added benefits: for example, incorporating a new bike lane or trail.
Impact on insurance rates	This can include City insurance or homeowners insurance or impact on the City's CRS rating.
City Comprehensive Plan element compliance	Considers how many elements of the Comprehensive Plan a project aligns with.
Integration of life/safety protection	Project design incorporates enhanced safety measures, increases protection of life or of assets critical to the protection of life.

Implementation Screening Criteria	
Permitting	Refers to type of permitting required. (can impact timeline, cost and effort level)
Scalability	Includes considerations of future flexibility, ability to ramp up (multi-phase), and/or ability to take project concept and apply in other neighborhoods.
Availability of Match Funding or Grant Eligibility	For example: Grant opportunities, matching funds or ability to leverage existing/planned investments.
Implementation timeframe	How quickly can the project be implemented? Or can it be completed in the desired timeframe?
Political support or sponsorship	Can include local, state, and/or federal support.
Ownership & Accessibility	Own all land needed vs. land acquisition or access agreements needed.
Public Outreach Effort	Measure of the level of effort anticipated for public outreach efforts.



DOWNTOWN WATERFRONT SEA LEVEL RISE STUDY
FERNANDINA BEACH, FLORIDA

Prepared for:

City of Fernandina Beach, Florida
Stormwater Utility Department
204 Ash Street
Fernandina Beach, FL 32034

Prepared by:

Andre L. Desilet, P.E.
Stormwater Utility Manager
City of Fernandina Beach, FL
204 Ash Street
Fernandina Beach, FL 32034

January 9, 2019

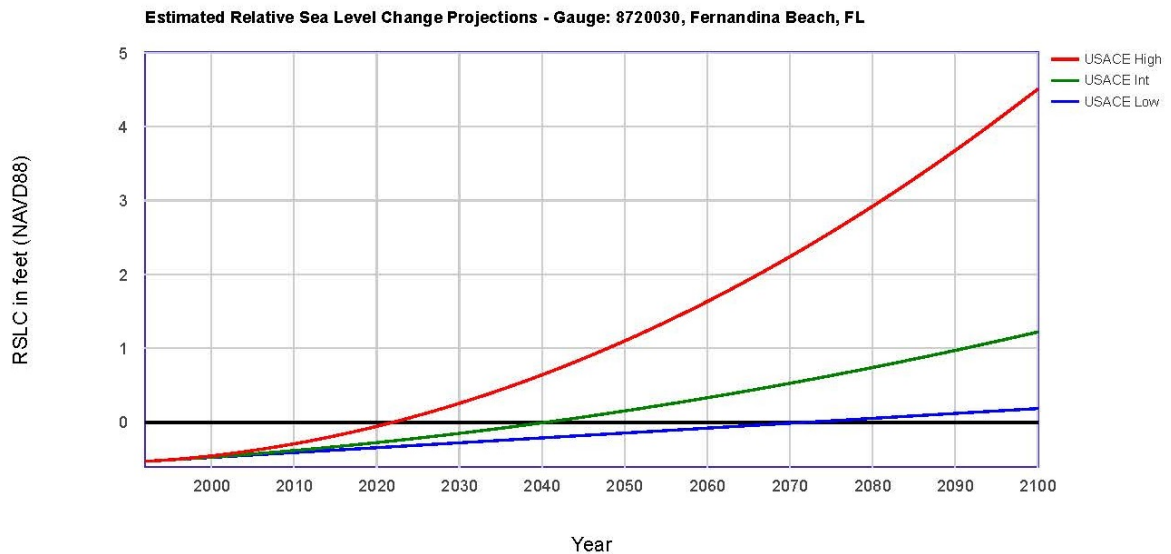
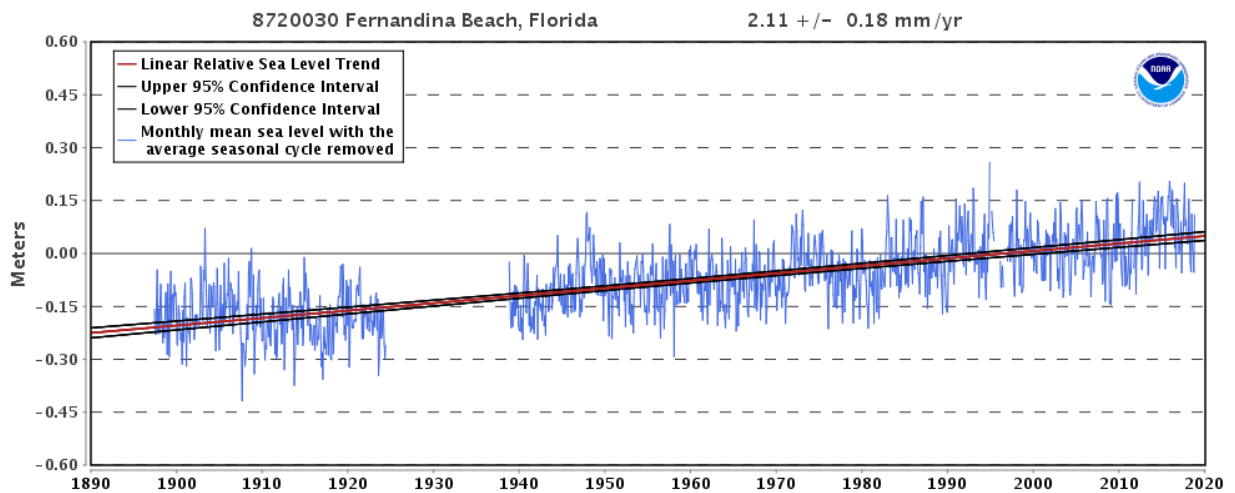
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1.0 Background

In an effort to increase the awareness of Sea Level Rise and further planning to increase resilience along the Fernandina Beach Downtown Waterfront, this report is intended to summarize available information and projections to establish design standards and planning objectives in this area.

Historical trends provide valuable data regarding global Sea Level Rise (SLR), but recent studies suggest an increase of the rate and magnitude of SLR. Scenarios do not predict future change, but describe potential future conditions in a manner that supports planning. The studies predict with confidence that global mean SLR will rise at least 8 inches, and no more than 6.6 feet by the year 2100. The scenarios presented in this report reflect the range of predictions and the impact on the Fernandina Beach Waterfront. Additional information concerning these projections can be found in *Global Sea Level Rise Scenarios for the United States National Climate Assessment*.



A tide station operated by the National Oceanic and Atmospheric Administration (NOAA) is located on a dock along the Fernandina Beach waterfront near the end of Calhoun Street. This station (#8720030) has been monitored since May 1897. All measurements and projections are specific to this station.



NOAA Tide Station #8720030, Fernandina Beach, FL

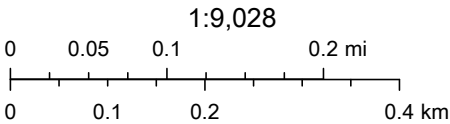
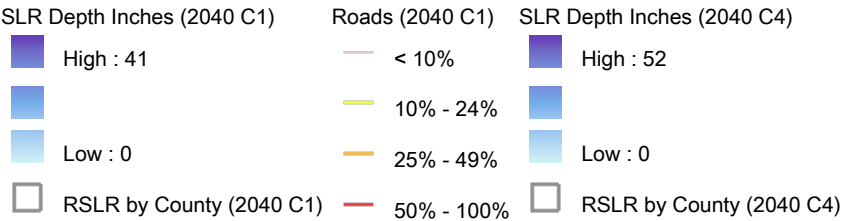
2.0 Assessment Tools

The University of Florida GeoPlan Sea Level Scenario Sketch Planning Tool was utilized to help visualize the impact to the Fernandina Beach Waterfront of the various projections for SLR. The following figures show the effects of the projected SLR scenarios for 2040 and 2100.

USACE 2040 Low SLR Projection



January 8, 2019



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACE 2040 Intermediate SLR Projection



January 8, 2019

SLR Depth Inches (2040 C2)

High : 44

Low : 0

Low : 0

RSLR by County (2040 C2)

Roads (2040 C2)

< 10%

10% - 24%

25% - 49%

50% - 100%

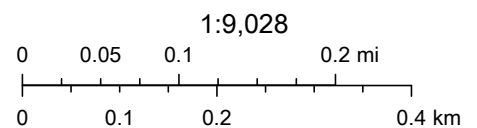
SLR Depth Inches (2040 C1)

High : 41

Low : 0

Low : 0

RSLR by County (2040 C1)



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACE 2040 High SLR Projection



January 8, 2019

SLR Depth Inches (2040 C4)

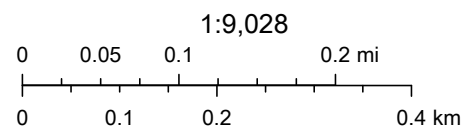
- High : 52
-
- Low : 0

RSLR by County (2040 C4)

Roads (2040 C4)

- < 10%
- 10% - 24%
- 25% - 49%
- 50% - 100%

Coastal Areas Mapped

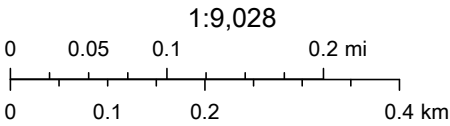
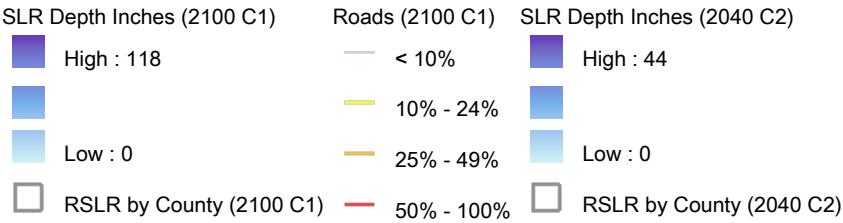


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACE 2100 Low SLR Projection



January 8, 2019



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACE 2100 Intermediate SLR Projection



January 8, 2019

SLR Depth Inches (2100 C2)

High : 58

Low : 0

Low : 0

RSLR by County (2100 C2)

Roads (2100 C2)

< 10%

10% - 24%

25% - 49%

50% - 100%

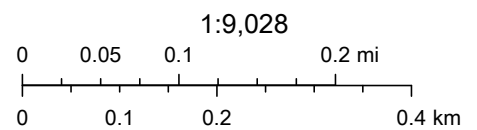
SLR Depth Inches (2100 C1)

High : 118

Low : 0

Low : 0

RSLR by County (2100 C1)



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

USACE 2100 High SLR Projection



January 8, 2019

SLR Depth Inches (2100 C4)

High : 98

Low : 0

Low : 0

RSLR by County (2100 C4)

Roads (2100 C4)

< 10%

10% - 24%

25% - 49%

50% - 100%

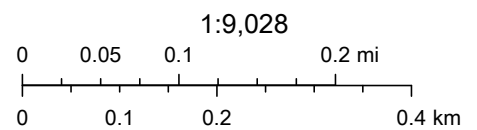
SLR Depth Inches (2100 C2)

High : 58

Low : 0

Low : 0

RSLR by County (2100 C2)



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

3.0 Conclusion

The simulations show the extent of currently dry ground that would be inundated by each projected SLR scenario. While the area is minimal along the Fernandina Beach waterfront, the projected SLR will contribute to increased flooding when combined with annual high tide events and storm surge. Base on this evaluation, adopting the USACOE Intermediate SLR projection for planning purposes is a reasonable approach. This projection indicates a SLR of 1.53' by the year 2100.

Print

Historic District Council (HDC) Certificate of Approval (COA) Application - Submission #7340

Date Submitted: 5/13/2021

HISTORIC DISTRICT COUNCIL (HDC): CERTIFICATE OF APPROVAL (COA) APPLICATION

USE THIS FORM TO Apply for approval for projects in the Downtown or Old Town Historic District or the Community Redevelopment Area (CRA). Projects may require either a Board-level review or a Staff-level review.

Fees

- | | |
|--|---|
| ☐ Certificate of Approval (COA): Staff Review \$25 | ☐ Demolition of a Primary Structure â€œ Contributing \$7,500 |
| ☒ Certificate of Approval (COA): Board Review - Residential Single Family) \$250 | ☐ After-the-Fact Certificate of Approval (COA): Staff Review \$100 |
| ☐ Certificate of Approval (COA): Board Review - Commercial/Multi-Family/2 or more Residential Units/Mixed Use \$400 | ☐ After-the-Fact Certificate of Approval (COA): Board Review \$1,500 |
| ☐ Demolition of a Primary Structure â€œ Non-Contributing \$1,500 | ☐ Amendment to Previously Approved COA - First Amendment Free, Subsequent Amendments = 1/2 cost of original fees |

Basis for Review

All applications, whether Staff or Board review, are reviewed for consistency with the City of Fernandina Beach Comprehensive Plan, Land Development Code, and applicable guidelines such as the Downtown Historic District Design Guidelines, Old Town Fernandina Preservation and Development Guidelines, and the Community Redevelopment Area (CRA) Design Guidelines. Guidelines for the Historic Districts are based on the U.S. Secretary of the Interiorâ€™s Standards for Rehabilitation.

HDC_2021 Meeting Calendar



IMPORTANT NOTES

Conceptual Approvals

Conceptual approvals are provided by the HDC as a courtesy to the applicant in an effort to allow comment from the Historic District Council and citizens during the conceptual design process. The HDC will provide the applicant with feedback and guidance relating to the proposal and take a vote to indicate whether the board feels the proposal is adequately appropriate to proceed. In all cases, the applicant must return to the HDC to seek final approval of their projects. There is no additional fee for this review above the Certificate of Approval fee.

Pre-Application Meeting

To guide you through the process and to ensure that your application is properly processed, you™ need to meet with the Preservation Planner prior to submitting your application. This should be done at least 45 days prior to your anticipated submittal date to allow time for review. Staff approval applications are accepted on a rolling basis and are generally completed in 3-5 days. Please note that projects can only begin after receiving a Certificate of Approval (COA) and a building, sign, or zoning permit (if required).

Application Requirements

- | | |
|---|---|
| ☒ A complete/ signed application; | ☐ Photographs; |
| ☐ Proof of Ownership (copy of deed or tax statement); | ☐ Any additional backup materials, as necessary; |
| ☒ A current survey of the property, for new construction and any change to existing footprint. (no older than two years); | ☐ If applying as an agent, Owner's Authorization for Agent Representation form must be signed/ notarized and submitted as part of the application; |
| ☒ Scaled elevations & plans; | ☐ For window replacement, a Window Survey must be completed. |

Please see the Land Development Code (LDC) for detailed information:

- ☐ Historic District Overlays " see LDC Section 8.01.01
- ☐ Specific Requirements within the OT-1 and OT-2 Zoning Districts " see LDC Section 8.01.01.02
- ☐ Amelia River Waterfront Community Redevelopment Area " see LDC Section 8.01.02
- ☐ Application Process for Certificate of Approval " see LDC Section 8.03.03
- ☐ Signage in the Historic Districts and Community Redevelopment Area " see LDC Section 8.01.03
- ☐ Requirements for Demolition Applications " see LDC Section 8.03.03.01
- ☐ Appeals - see LDC Section 8.03.09

The LDC is Available for Review at

www.fbfl.us/LDC

Appeals

An applicant may appeal the HDC's decision for variances to a court of record as outlined in LDC Section 10.02.04(D). The petition shall be presented to within thirty (30) days after the decision of the HDC; otherwise the decision of the HDC will be final.

PROJECT TYPE*

New Construction

APPROVAL TYPE*

Board Approval: Final

See Certificate of Approval Matrix for details

Previously Approved Case

Have you met with a planner for a pre-application meeting?*

Yes

What was the date of your pre-application meeting?*

5/12/2021

Please apply for a required pre-application meeting using the following link:

[HDC Pre-Application Meeting Request](#)

PROPERTY INFORMATION

[Property information can be found at the Nassau County Property Appraiser's website â†’ Map Search](#)

Historic District*

Waterfront Community Redevelopment Area (CRA) ▼

Site Address*

1180 S 5th Street Extension

City*

fernandina Beach

State*

Florida

Zip Code*

32034

Parcel ID #(s)*

00-00-31-1760-0031-0020, 00-00-31-1760-0029-0010

OWNER OF RECORD

As recorded with the Nassau County Property Appraiser

First Name*

City of Fernandina Beach

Last Name*

George

Mailing Address*

204 Ash Street

City*

Fernandina Beach

State*

Florida

Zip Code*

32034

Telephone Number*

904-310-3421

E-mail Address*

cgeorge@fbfl.org

OWNER'S AGENT

If other than owner. If an agent will be representing the owner, an Owner's Authorization For Agent Representation form must be included

Is there an agent other than the owner representing this project?*

No ▼

First Name*

Last Name*

Company (if applicable)

Street Address

City

State

Zip

Telephone Number

E-mail Address

Project Description*

The project is the first phase component of the City's overall Waterfront stabilization & Resiliency program consisting of the installation of a new 838 ft riverfront bulkhead and boardwalk system and associated features. the project is located on the southern end of the City's waterfront and is to provide protection to the adjacent downtown areas in the City from storm surge and high water flooding events. the existing site contains a pubic pedestrian timber boardwalk along a vegetated river and marsh front low profile embankment with undeveloped green space and public parking areas Construction will consist of the installation of anew composite sheet pile bulkhead with a cast in place concrete cap set at an elevation of +9.0 to withstand and block anticipated storm surge and flood waters. In front of the bulkhead will be a new coquina concrete pedestrian boardwalk to replace the existing timber walkway system that will be removed. The new concrete walk will match the existing elevation of the timber walkway in place. within the bulkhead's concrete cap will be recessed, downward focused foot path lighting. A new armored slope protection system consisting of articulating concrete block mattress will be placed along the existing embankment slop along with a living shoreline system involving placement of oyster shell filled burlap bags and wetlands-type grass plantings. of the 838 ft of waterfront stabilization, 200 ft will require a handrail system due to the height of the new boardwalk and the top of the existing slope exceeding the maximum 30". A new 30 ft long timber retaining wall will also be installed at the marina's southern dock's access. Minor selective demolition of signage vegetation, and some site features along the bulkhead alignment for its installation. the alignment of the bulkhead landward of the boardwalk is necessary to avoid damage to the exiting root systems of the vegetation that will remain. the materials to be used consist of the following: Bulkhead: composite sheet piles with cast in place concrete cap Boardwalk: cast in place slab on grade concrete with coquina sell Timber retaining wall: pressure treated southern pine lumber Slope Protection System: articulating open cell concrete mattress Living shoreline: oyster shell filled burlap bags with grass plantings

Describe the proposed project in terms of size, affected architectural elements, materials, and relationship to the existing structure(s).

Design Vision Statement*

The architectural features are consistent with typical southeastern U.S. coastal protection structures utilizing sustainable concrete construction. The structures will be basically low profile visible concrete

For New Construction: Please write a brief design statement explaining the architectural style of your project; what its design draws inspiration from; and how it is architecturally compatible with the surrounding historic neighborhood.

Requirements for Demolition Applications

Per LDC 8.03.03.01

1. Does the structure or site meet national, state, or local criteria for designation?

2. Is the structure or site a contributing structure or site to a locally designated or National Register historic district?

3. Would the loss of the structure or site deteriorate the quality or continuity of the historic district, or the surrounding neighborhood?

4. Is the structure or site is of such design, crafts manship, or material that it could be reproduced only with great difficulty and/or expense?

5. Is the structure or site one of the last remaining examples of its kind in the neighborhood, county or region, or is a distinctive example of an architectural or design style which contributes to the character of the district?

6. Would the removal of the structure or site destroy the historic relationship between structures or open space?

7. Would retention of the structure or site promotes the general welfare of the City by providing an opportunity for study of local history, architecture, and design, or by developing an understanding of the importance and value of a particular culture and heritage?

8. Have the applicants made good faith efforts to pursue alternatives to demolition?

9. Will the applicant be denied a reasonable return on his or her investment

10. Is there an economic hardship for the applicant as demonstrated by requirements in Section 8.03.06?

11. Has the Code Enforcement and Appeals Board has recommended demolition of the structure?

MATERIALS

List all proposed materials and colors, as applicable

EXTERIOR FABRIC

Manufacturer	Product Description	Color
		(Name/Number)

DOORS

Manufacturer	Product Description	Color
	Include FL Product Approval # for Windows and Doors	(Name/Number)

WINDOWS

Manufacturer	Product Description	Color
	Include FL Product Approval # for Windows and Doors	(Name/Number)

ROOFING

Manufacturer	Product Description	Color
		(Name/Number)

FASCIA/TRIM

Manufacturer	Product Description	Color
		(Name/Number)

FOUNDATION

Manufacturer	Product Description	Color
		(Name/Number)

SHUTTERS

Manufacturer	Product Description	Color
		(Name/Number)

PORCH/DECK

Manufacturer	Product Description	Color
		(Name/Number)

FENCING

Manufacturer	Product Description	Color
		(Name/Number)

DRIVEWAYS/SIDEWALKS

Manufacturer	Product Description	Color
		(Name/Number)

SIGNAGE

Manufacturer	Product Description	Color
		(Name/Number)

OTHER

Manufacturer	Product Description	Color
		(Name/Number)

Please upload supplemental documentation and all product brochures, paint color samples, etc.

Upload 1 City of Fernandina Beach Amelia River Waterfront Stabilization.pdf	Upload 2 Choose File No file selected	Upload 3 Choose File No file selected	Upload 4 Choose File No file selected
Upload 5 Choose File No file selected	Upload 6 Choose File No file selected	Upload 7 Choose File No file selected	Upload 8 Choose File No file selected

Certification*

☒

By signing below, I certify that the information contained in this application is true and correct to the best of my knowledge at the time of the application.

☒

I acknowledge that I understand and have complied with all of the submittal requirements and procedures and have read and understand the following:

1. I/We hereby attest to the fact that the above supplied property address(es), parcel number(s) and legal description(s) is (are) the true and proper identification of the area of this petition.
2. I/We authorize staff from the Department of Planning & Conservation to enter onto the property in question during regular city business hours in order to take photos which will be placed in the permanent file.
3. I/We understand that the COA review time period will not commence until the application is deemed complete by staff and may take up to 10 days to process. I further understand that an incomplete application submittal may cause my application to be deferred to the next posted deadline date.
4. I/We understand that, for Board review cases, an agenda and staff report will be available on the City’s website approximately one week before the Historic District Council meeting.
5. I/We understand that the Historic District Council meetings are conducted in a quasi-judicial hearing and as such, ex-parte communications are prohibited (Communication about your project with a Historic District Council member).
6. I/We understand that the approval of this application by the Historic District Council or staff in no way constitutes approval of a Building Permit for construction from the City of Fernandina Beach Building Department.
7. I/We understand that all changes to the approved scope of work stated in a COA have to be approved by the HDC before work commences on those changes. There will be no charge for a revision to a COA. Making changes that have not been approved can result in a Stop Work Order being placed on the entire project and/or additional fees/penalties.
8. I/We understand that any decision of the HDC may be appealed to the City Commission, with the exception of variances, which may be appealed to a court of record as outlined in Section 10.02.04(D) of the Land Development Code. Petitions to appeal shall be presented within thirty (30) days after the decision of the HDC; otherwise the decision of the HDC will be final.
9. I/We understand that Certificates of Approval are only valid for one (1) year from issuance. They are renewable for six months without cause, and for an additional six months, upon showing of good cause by the applicant. The applicant must submit all requests for extensions in writing and provide appropriate support documentation, if needed.

Applicant First Name*	Applicant Last Name*
Charles	George

Today's Date*

5/13/2021



DEPARTMENT OF PLANNING & CONSERVATION

204 Ash Street | Fernandina Beach Florida 32034 | 904 310-3480 | www.fbfl.us/planning

Please make sure to disable pop-up blocker in order to submit.

CONTRACT DRAWINGS FOR:

CITY OF FERNANDINA BEACH

FRONT STREET
FERNANDINA BEACH, FL 32034

- **AMELIA RIVER WATERFRONT STABILIZATION
PARKING LOTS C & D**

U.S. Army Corps of Engineers Nationwide Permits 13 and 54 Verification
SAJ-2020-01718

Application for State of Florida Environmental Resource Permit (62-330, F.A.C.)



Certificate of Authorization # 3428
4730 Casa Cola Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107

PASSERO ASSOCIATES
PROJECT NUMBER 99000047.0095



CITY OF FERNANDINA BEACH
204 ASH STREET
FERNANDINA BEACH, FL 32034



BID SET

May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\G1-02 INDY.dwg G1-2 INDY May 07, 2021 3:34pm by: EBrdestegee

ESTIMATE OF QUANTITIES – BASE BID				
ITEM	DESCRIPTION	UNIT	TOTAL	AS-BUILT
BASE BID				
101-1	MOBILIZATION	LS	1	—
110-1	ALONG BOARDWALK: CLEARING AND GRUBBING	AC	0.343	—
110-2	ALONG RIVERBANK: TRASH DEBRIS REMOVAL & DISPOSAL	LS	1	—
110-3	ALONG WETLANDS (SOUTH BOUNDARY) AND PETANQUE AREA: TRASH DEBRIS REMOVAL & DISPOSAL	LS	1	—
M-100	MAINTENANCE AND PROTECTION OF TRAFFIC	LS	1	—
02-41-00	SELECTIVE DEMOLITION OF MINOR STRUCTURES – TIMBER BOARDWALK	LS	1	—
524.1	OPEN CELL ARTICULATING CONCRETE BLOCK HAND-PLACED (INCLUDING ANCHORED ENDS)	SY	915	—
P-156	TEMPORARY SOIL EROSION AND SILTATION CONTROL	LS	1	—
C3-6	"I" WALL WITH COQUINA MIX CONCRETE MONOLITH	LF	793	—
C3-1	8'-0" WIDE COQUINA MIX CONCRETE BOARDWALK ON GRADE	LF	515	—
C3-2	12'-0" WIDE COQUINA MIX BOARDWALK ON GRADE AT TIMBER BULKHEAD	LF	278	—
C2-5	NEW TIMBER PILE BULKHEAD TO MATCH EXISTING TIMBER PILE BULKHEAD	LF	25	—
02-41-00	SELECTIVE DEMOLITION OF (2) EXISTING TIMBER DOCK CONNECTORS	LS	1	—
C2-5	(2) NEW TIMBER DOCK CONNECTORS FROM NEW BOARDWALK TO EXISTING TIMBER DOCKS	LS	1	—
08-42-39	PRESSURE-RESISTANT SINGLE FLOOD PLANKBARRIER SYSTEM AT (4) OPENINGS	LS	1	—
26-50-00	EXTERIOR WATERPROOF RECESSED LED PATHWAY LIGHTING INCLUDING CONDUITS, WIRING AND PHOTOCCELL	LS	1	—
P-152-6.1	UNCLASSIFIED EXCAVATION	LS	1	—
P-152-6.3	EMBANKMENT IN PLACE	LS	1	—
S-126-5.1	PROJECT SURVEY & STAKEOUT	LS	1	—
S-126-5.2	AS-BUILT SURVEY & FINAL CROSS SECTIONS	LS	1	—
T-904	BERMUDA SOD WITH RYE OVERSEEDING	SY	645	—
T-905	3" MINIMUM TOPSOILING	SY	645	—
4/C3-4	OYSTER BAG REEF	LF	645	—
T-912	EXOTIC PLANT CONTROL	LS	1	—
T-914-1	MAINTENANCE VENTS	EA	8	—
T-914-2	MONITORING EVENTS	EA	—	—
—	—	—	—	—
—	—	—	—	—
BID ADDITIVE "1"				
02-41-00	COMPLETE DEMOLITION OF EXISTING MARINA BATH-HOUSE AND RESTROOM BUILDING INCLUDING SITE RESTORATION	LS	1	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—

UTILITY LEGEND

⊙	STORM MANHOLE
■ □	STORM INLET
■	YARD DRAIN
● □	CLEANOUT/LAMPHOLE
x	INVERT LOCATION
○	SPRINKLER
⌒	HEADWALL
⊙	SANITARY SEWER
⌘	FIRE HYDRANT
⌘	WATER VALVE
⊙	WATER METER
⊙	WATER MANHOLE
⊙	ELECTRICAL MANHOLE
⊙	ELECTRICAL HANDHOLE
⊙	PULL BOX
⊙	JUNCTION BOX
⊙	ELECTRICAL BOX
⊙	ELECTRICAL METER
⊙	TRANSFORMER
⊙	ELECTRICAL PEDESTAL
⊙	UTILITY POLE
⊙	LIGHT POLE
⊙	DUCTBANK MARKER
⊙	COMMUNICATIONS MANHOLE
⊙	CABLE MARKER
⊙	TELEPHONE PEDESTAL
⊙	COMMUNICATIONS BOX
⊙	TELEPHONE BOOTH
⊙	TRAFFIC BOX
⊙	GAS MARKER
⊙	GAS VALVE
⊙	GAS METER
⊙	GAS REGULATOR
⊙	A/C UNIT
—	SIGN
⊙	BOLLARD
=====	STORM LINE
-----	DITCH
—SS—SS—	SANITARY LINE
—W—W—W—	WATER LINE
—IR—IR—IR—	IRRIGATION SLEEVE
-----	CONDUIT
=====	DUCT BANK
—FO—FO—	FIBER OPTIC LINE
—C—C—C—	COMMUNICATION LINE
—GAS—	NATURAL GAS LINE
—F—F—F—	FUEL LINE
—X—X—	FENCE LINE

LEGEND

⊙	CABLE TELEVISION PEDESTAL
⊙	ELECTRICITY METER
☆	ALUMINUM LIGHT POLE
⊙	COVERED AREA
⊙	TELEPHONE PEDESTAL
⊙	WATER METER
⊙	WATER VALVE
⊙	IRRIGATION CONTROL VALVE
⊙	BENCHMARK
△	WETLAND FLAG
⊙	CENTERLINE
CB	CHORD BEARING
CD	CHORD DISTANCE
CH	CHORD
RCP	REINFORCED CONCRETE PIPE
HDPE	HIGH-DENSITY POLYETHYLENE
ELEV	ELEVATION
NAVD	NORTH AMERICAN VERTICAL DATUM
O.R.B.	OFFICIAL RECORDS BOOK
R	RADIUS
R/W	RIGHT-OF-WAY

TREE LEGEND

CDR	=	CEDAR TREE
HB	=	HACKBERRY TREE
PM	=	PALM TREE

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C7-3	EXISTING UTILITY PLAN
C7-4	EXISTING UTILITY PLAN

PA

PASSERO ASSOCIATES
engineering architecture
www.passero.com

BID SET

Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Gaze Creek Way, Suite 200
St. Augustine, FL 32093
Principal-in-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredestegee

Revisions			
No.	Date	By	Description

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§11.03(5). THESE PLANS ARE COPYRIGHT PROTECTED ©

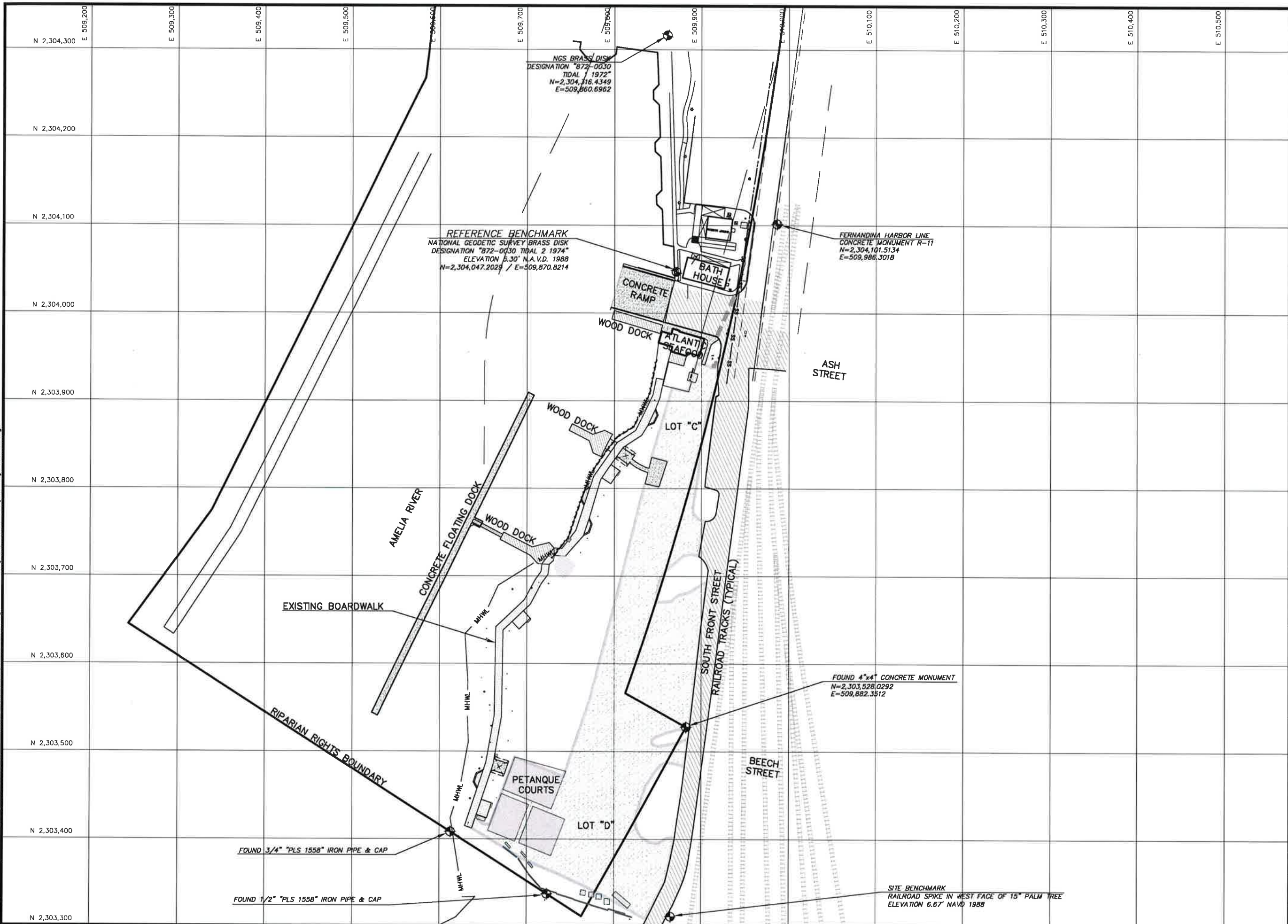
INDEX OF
DRAWINGS,
ABBREVIATIONS,
LEGEND & SUMMARY
OF QUANTITIES

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

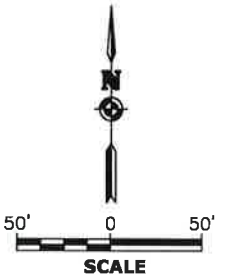
Project No.
99000047.0095

Drawing No.
G1-2
Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\G1-03_CTRL.dwg CTRL May 07, 2021 2:55pm by: EBradestage



BID SET



Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Cass Cole Way, Suite 200
St. Augustine, FL 32092
Principal-in-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bradestage

Revisions			
No.	Date	By	Description

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**HORIZONTAL
AND VERTICAL
CONTROL PLAN**

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
G1-3

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Report\G1-04_GENL-NOTE.dwg G1-4_GENL-NOTE May 07, 2021 2:58pm by: EBredestage

GENERAL NOTES

1. THE INTENT OF THIS CONTRACT IS TO COMPLETE THE PROJECT WITH MINIMAL AMOUNT OF DELAYS TO THE OWNER (I.E. THE SHORTEST AMOUNT OF THE ACTIVE MARINA AREAS ARE OUT OF SERVICE).
2. THE CONTRACTOR SHALL GIVE A 48-HOUR NOTICE TO THE OWNER PRIOR TO THE START OF CONSTRUCTION, SO THAT THE OWNER CAN ISSUE THE APPROPRIATE NOTICE.
3. ALL CONSTRUCTION ACTIVITIES SHALL BE COMPLETED WITHIN 270 CALENDAR DAYS.
4. IN THE CASE OF A HURRICANE WARNING OR A TROPICAL STORM WARNING FOR THE COUNTY, THE CONTRACTOR SHALL SECURE THE SITE TO THE EXTENT PRACTICAL AND REMOVE MATERIAL AS REQUIRED UNTIL SUCH TIME AS THE STORM EVENT PRECLUDES ANY FURTHER ACTIVITY ON SITE.
5. SILT FENCE SHALL BE MAINTAINED IN FUNCTIONAL WORKING CONDITION. THE SILT FENCE SHALL BE KEPT IN GOOD REPAIR AND REPLACED AND RESTAKED AS NECESSARY IN COMPLIANCE WITH BEST MANAGEMENT PRACTICES. INCLUDE ALL EROSION CONTROL COSTS IN ITEM P-156.
6. THE STAGING STOCKPILE AREA SHALL BE KEPT IN A WORKMANLIKE MANNER WITH 2:1 MAXIMUM SIDE SLOPES AND A MAXIMUM HEIGHT OF 12 FEET ABOVE THE EXISTING GROUND.
7. TRUCKS SHALL BE EQUIPPED WITH APPROVED LOAD COVERS THAT WILL BE SECURED ALONG THE TRUCK ROUTE (FRONT STREET).
8. THE TRUCKS SHALL BE LOADED SO THAT NO MATERIAL AT ANY POINT IN THE BED IS HIGHER THAN THE SIDE OF THE TRUCK BED.
9. ANY MATERIAL SPILLED FROM ANY TRUCK ALONG THE ROUTE (FRONT STREET) IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE CLEANED UP IMMEDIATELY, AS DIRECTED BY THE ENGINEER.
10. OPERATIONS WILL INCLUDE THE USE OF A FLAGGER IF REQUIRED TO DIRECT TRAFFIC DURING BACKING AND OFFLOADING.
11. SIDE SLOPES OF THE STAGING STOCKPILE AREA AND SPOIL TRANSFER AREA ARE TO BE STABILIZED WITH HYDRO-MULCH AT THE END OF EACH DAY.
12. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DEVELOP A SPILL PREVENTION AND COUNTERMEASURES PLAN AND A STORMWATER POLLUTION PREVENTION PLAN FOR THE ENGINEER'S APPROVAL, AND MAINTAIN SAME.
13. NOTICES TO OWNER (CITY) - PROVIDE THE NECESSARY INFORMATION ON CONSTRUCTION CONDITIONS CLOSURES, ETC.) TO THE OWNER MINIMUM OF 48 HOURS PRIOR SO THAT A NOTICE CAN BE ISSUED IN ACCORDANCE WITH ESTABLISHED CRITERIA BY THE OWNER TO THE MARINA.
14. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE STORAGE AND SECURITY OF HIS MATERIAL AND EQUIPMENT AND SHALL ERECT STORAGE FACILITIES AND FENCING AS NECESSARY. THE CONTRACTOR'S STORAGE AND STAGING AREAS SHALL BE IN THE LOCATIONS SHOWN ON DRAWING G2-1: OVERALL PLAN.
15. CONSTRUCTION STAKE-OUT SHALL BE PERFORMED BY CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL MEASUREMENTS THAT MAY BE REQUIRED TO LAYOUT THE CONSTRUCTION. THE COST OF STAKING WILL BE INCLUDED IN ITEM S-126-5.1.
16. THE CONTRACTOR'S STAGING AREA(S) SHOWN ON THE PLANS ARE GENERAL AND FOR INFORMATIONAL PURPOSES ONLY. THE ACTUAL SIZE AND LOCATION OF STAGING AREAS WILL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION COMMENCEMENT.
17. ALL NON-PAVED AREAS OUTSIDE THE LIMITS OF CONSTRUCTION WHICH ARE DISTURBED BY THE CONTRACTOR'S OPERATIONS, SUCH AS THE CONTRACTOR'S ACCESS ROAD (FRONT STREET), STAGING AREA, ETC., SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND SODDED UPON COMPLETION OF THE PROJECT. IN ADDITION, ALL EXISTING PARKING AREAS THAT WILL BE USED AS THE CONTRACTOR'S STAGING AREA(S) SHALL BE MAINTAINED DURING CONSTRUCTION AND RESTORED TO THEIR PRE-CONSTRUCTION CONDITION. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR THIS ITEM.
18. THE CONTRACTOR SHALL CONDUCT HIS CONSTRUCTION OPERATIONS AS SHOWN ON THE PLAN DRAWINGS. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH THE OWNER'S (CITY OF FERNANDINA BEACH) CITY ENGINEER TO MINIMIZE INTERFERENCE TO MARINA OPERATIONS DURING CONSTRUCTION.
19. THE CONTRACTOR SHALL KEEP A WATER TRUCK ON SITE AT ALL TIMES FOR THE PURPOSE OF CONTROLLING DUST AS REQUIRED BY THE ENGINEER.
20. THE CONTRACTOR SHALL VISIT THE SITE TO DETERMINE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. THE CONTRACTOR SHALL REPORT TO THE OWNER'S (CITY OF FERNANDINA BEACH) CITY ENGINEER ANY VARIATIONS FROM THE INFORMATION SHOWN ON THE CONSTRUCTION PLANS.
21. ANY UNPLANNED, UNAPPROVED, OR ACCIDENTAL SHUTDOWN OR INTERRUPTION OF SERVICE TO ANY LIGHTING CIRCUIT OR MARINA REQUIRES IMMEDIATE NOTIFICATION TO THE CITY ENGINEER BY THE CONTRACTOR.
22. ALL DISPUTES ARISING FROM THE CONTRACTOR SHALL BE DECIDED BY THE OWNER'S (CITY OF FERNANDINA BEACH), WHOSE DECISION SHALL BE FINAL.
23. THE CONTRACTOR SHALL OBTAIN AND PAY ASSOCIATED FEES FOR ALL OUTSTANDING PERMITS NECESSARY FOR THE COMPLETION OF THIS PROJECT.
24. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE CLEANUP AND DISPOSAL OF ALL TRASH AND DEBRIS CREATED BY HIS WORK OR PERSONNEL. NO BURNING IS ALLOWED ON SITE. ALL TRASH AND DEBRIS MUST BE DISPOSED OF OFF SITE.
25. THE CONTRACTOR SHALL MAINTAIN SECURITY WITHIN THE PROJECT SITE AT ALL TIMES. NO UNAUTHORIZED PERSONNEL SHALL BE ALLOWED ON THE SITE. ALL GATES MUST BE LOCKED AT ALL TIMES. A GATE GUARD MAY BE USED. NO ADDITIONAL PAYMENT WILL BE MADE IF CONTRACTOR ELECTS TO USE A GATE GUARD.
26. THE TEMPORARY IMPACT AREAS WILL BE RESTORED/REPLANTED TO PRE-CONSTRUCTION CONDITIONS.
27. ALL EROSION CONTROL DEVICES ARE TO BE MAINTAINED IN GOOD FUNCTIONING ORDER. ALL SILT FENCES AND TURBIDITY CURTAINS ARE TO BE INSPECTED, AND REPLACED IF NECESSARY, FOLLOWING ANY RAINFALL EVENT.

UTILITY NOTES

1. CONTRACTOR WILL PROTECT ALL EXISTING LIGHTING, SIGNS, AND EQUIPMENT IN THE VICINITY OF THE WORK AREA. ANY DAMAGE WILL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.
2. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND PROVIDING ALL PERMANENT AND TEMPORARY UTILITY CONNECTIONS TO THE STAGING AREA.
3. PRIOR TO DIGGING ANY TRENCHES, CONTRACTOR SHALL NOTIFY ALL UTILITIES (ELECTRIC, GAS, TELEPHONE, WATER, SEWER) AND OBTAIN LOCATIONS OF UNDERGROUND UTILITIES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND IDENTIFICATION OF ALL EXISTING UTILITIES AND UNDERGROUND PIPELINES IN CONSTRUCTION AREA. ANY DAMAGES TO EXISTING UTILITIES OR UNDERGROUND PIPELINES ON OR OFF CITY PROPERTY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL REPAIR WORK SHALL MEET THE APPROVAL OF THE OWNER OF THE DAMAGED UTILITY. NO REIMBURSEMENT WILL BE ALLOWED FOR UTILITY/PIPE REPAIR OR REPLACEMENT.
5. ANY UNPLANNED, UNAPPROVED, OR ACCIDENTAL SHUTDOWN OR INTERRUPTION OF SERVICE TO ANY LIGHTING CIRCUIT OR THE MARINA REQUIRES IMMEDIATE NOTIFICATION TO THE OWNER'S (CITY OF FERNANDINA BEACH) CITY ENGINEER BY THE CONTRACTOR. THE COST OF MATERIALS AND LABOR REQUIRED TO REPAIR THE LIGHTING CIRCUIT SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

1. FOR ALL ITEMS REQUIRING THE USE OF WATER, THE CONTRACT UNIT PRICE BID FOR THE RESPECTIVE ITEM SHALL INCLUDE THE COST OF FURNISHING THE WATER (TYPICAL).

COORDINATION AND OPERATIONS

1. THE CONTRACTOR SHALL ACQUAINT SUPERVISORS AND SUBCONTRACTORS EMPLOYEES TO THE TRAFFIC ACTIVITY AND OPERATIONS THAT MAY BE IMPACTED BY THIS PROJECT. THE CONTRACTOR SHALL CONDUCT CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY TRAFFIC REQUIREMENTS AND GUIDELINES AS NOTED AND/OR SHOWN ON THE PLANS.
2. THE CONTRACTOR SHALL CONDUCT WEEKLY COORDINATION MEETINGS TO DISCUSS WORK AREAS, SCHEDULING, SAFETY, ETC. WITH THE ENGINEER AND OTHER APPROPRIATE OFFICIALS. MINUTES FROM THE WEEKLY MEETINGS SHALL BE PREPARED BY THE CONTRACTOR, UNLESS OTHERWISE DIRECTED BY THE ENGINEER, AND COPIES DISTRIBUTED TO ALL APPROPRIATE INDIVIDUALS.
3. CONSTRUCTION AND MAINTENANCE OPERATIONS BY OTHERS MAY OCCUR CONCURRENTLY AND AT TIMES IN THE VICINITY OF CONSTRUCTION ASSOCIATED WITH THIS PROJECT. THE CONTRACTOR SHALL COORDINATE HIS OPERATIONS AND COOPERATE WITH MAINTENANCE CREWS AND OTHER CONTRACTORS WORKING IN THE AREA. COORDINATION WITH APPROPRIATE GOVERNMENT AND UTILITY AGENCIES IS ALSO REQUIRED.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR TOWING/RELOCATING VEHICLES WITHIN THE PARKING LOT.

CONSTRUCTION LAYOUT

1. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT, INCLUDING RESTAKING/LAYOUT AS REQUIRED TO COMPLETE THE PROJECT (TYPICAL).
2. ALL EXISTING SURVEY MONUMENTS SHALL BE PROTECTED BY THE CONTRACTOR DURING CONSTRUCTION. ALL MONUMENTS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESET TO REQUIRED STANDARDS BY A REGISTERED SURVEYOR (STATE OF FLORIDA) AT THE CONTRACTOR'S EXPENSE, TO THE SATISFACTION OF THE ENGINEER.
3. THE CONTRACTOR SHALL CONFIRM EXISTING GRADE ELEVATIONS AND PROVIDE AN OPPORTUNITY FOR THE ENGINEER (OR REPRESENTATIVE) TO REVIEW THE PROPOSED LAYOUT/GRADES PRIOR TO ACTUAL CONSTRUCTION.

CONTRACTOR'S REQUIREMENTS

1. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS REQUIRED FOR THE PERFORMANCE OF THIS CONTRACT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FILE/OBTAIN AND TO PAY ALL PERMIT FEES. COSTS FOR PERMITS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
2. THE CONTRACTOR MUST OBTAIN PROPER PERMITS FOR DELIVERY OF MATERIALS AND EQUIPMENT TO THE SITE. ANY DAMAGE TO OFF-SITE AND/OR ON-SITE ROADS SHALL BE THE COMPLETE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PROMPTLY REPAIRED AT THE CONTRACTOR'S SOLE EXPENSE.
3. ALL CONTRACTOR'S VEHICLES AND TRAFFIC (UNLESS OTHERWISE AUTHORIZED) SHALL REMAIN WITHIN THE DESIGNATED STAGING AREA, CONSTRUCTION LIMITS OR HAUL ROUTES. CONTRACTOR VEHICLES, INCLUDING EMPLOYEE VEHICLES WILL NOT BE PERMITTED TO PARK IN PUBLIC PARKING LOTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ADDITIONAL STAGING AREA IS NEEDED. ADDITIONAL AREA MAY BE MADE AVAILABLE IF OPERATIONS PERMIT.
4. ALL CONTRACTOR VEHICLES SHALL BE IN GOOD WORKING ORDER WHILE ON THE WORK SITE.
5. THE CONTRACTOR SHALL RESTORE ALL HAUL ROUTE PAVEMENTS TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE OWNER AND THE ENGINEER. THE CONTRACTOR SHALL REPAIR DAMAGE TO PUBLIC ROADWAYS RESULTING FROM HIS CONSTRUCTION OPERATIONS WITHIN 24 HOURS, AND TO THE SATISFACTION OF THE APPROPRIATE JURISDICTIONS.
6. CONTRACTOR SHALL CONFORM TO AND IMPLEMENT THE CONSTRUCTION SAFETY AND PHASING PLAN IN THE CONTRACT DOCUMENTS.
7. NPDES AND ALL ASSOCIATED STORM WATER PERMITTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COST SHALL BE INCIDENTAL TO THE PROJECT.

AS-BUILT DRAWINGS/MEASUREMENTS

1. THE CONTRACTOR SHALL, UPON COMPLETION OF THE WORK, FURNISH TO THE ENGINEER AS-BUILT SURVEY FOR ALL WORK ITEMS ASSOCIATED WITH THE PROJECT INCLUDING LOCATION COORDINATES AND ELEVATIONS (MSL), DIMENSIONS AND FINAL AS-BUILT QUANTITIES. INFORMATION SHALL BE PROVIDED IN ELECTRONIC (AUTOCAD (VERSION 2020 COMPATIBLE) OR OTHERWISE SPECIFIED BY THE OWNER) FORMAT TO THE ENGINEER PRIOR TO PROJECT FINAL ACCEPTANCE. ALL AS-BUILT/RECORD INFORMATION SHALL BE PREPARED UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL SURVEYOR/ENGINEER, AND STAMPED/SEALED BY SAID PROFESSIONAL UPON FINAL SUBMITTAL TO THE OWNER.

UNDERGROUND UTILITIES

1. THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS HAVE BEEN OBTAINED FROM AVAILABLE RECORDS AND FIELD CHECKS, AND ARE BELIEVED TO BE CORRECT. NO GUARANTEE IS MADE AS TO THEIR ACCURACY OR COMPLETENESS. THE CONTRACTOR SHALL LOCATE AND IDENTIFY ALL UNDERGROUND UTILITIES IN THE WORK AREA PRIOR TO CONSTRUCTION. ANY UNDERGROUND UTILITIES LOCATED WHICH DO NOT APPEAR ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. ANY DAMAGE TO UTILITIES, CAUSED BY THE CONTRACTOR, SHALL BE REPAIRED AT THE CONTRACTOR'S SOLE EXPENSE.
2. ALL ELECTRICAL CIRCUITS AND/OR UTILITIES AFFECTED BY THIS PROJECT SHALL BE PROTECTED AND MAINTAINED DURING OPERATIONAL PERIODS BY THE CONTRACTOR. THE CONTRACTOR, AT HIS/HER EXPENSE SHALL IMMEDIATELY REPAIR, WITH IDENTICAL MATERIAL AND BY SKILLED WORKMEN, ANY UNDERGROUND CABLES WHICH ARE DAMAGED BY THEIR ACTIVITIES, WORKMEN, EQUIPMENT OR PERSONNEL. PRIOR WRITTEN APPROVAL BY THE OWNER MUST BE OBTAINED FOR THE MATERIALS, WORKMEN, TIME, AND METHOD OF REPAIRS AND FOR ANY TEMPORARY OR PERMANENT REPAIRS THE CONTRACTOR PROPOSES TO MAKE TO FACILITIES DAMAGED BY THE CONTRACTOR. SUCH REPAIRS MUST BE STARTED IMMEDIATELY AFTER LOCATING DAMAGED FACILITY AND CONTINUED UNTIL COMPLETE. THE OWNER MAY ELECT TO HAVE ANY REPAIR PERFORMED BY OTHERS AT THE CONTRACTORS SOLE EXPENSE.

UTILITIES NOTIFICATION

1. THE CONTRACTOR SHALL NOTIFY, AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITY FACILITIES, THE ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE, AND THE OWNER OF EACH UNDERGROUND UTILITY FACILITY SHOWN ON THE PLANS.
2. THE CONTRACTOR SHALL GIVE THE OWNER OF THE UNDERGROUND UTILITY A MINIMUM OF FORTY-EIGHT HOURS, EXCLUDING SATURDAYS, SUNDAYS, AND LEGAL HOLIDAY AFTER NOTICE IS RECEIVED, TO STAKE, MARK, OR OTHERWISE DESIGNATE THE LOCATION OF THE UNDERGROUND UTILITY FACILITIES IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY ARE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO DAYS AHEAD OF THE PLANNED CONSTRUCTION. NO DIGGING SHALL PROCEED WITHOUT WRITTEN APPROVAL OF THE ENGINEER.
3. THE LOCATION OF UTILITIES SHOWN WITHIN THESE PLANS ARE APPROXIMATE ONLY AND THOSE SHOWN ARE NOT NECESSARILY ALL OF THE UTILITIES AND STRUCTURES. THE EXACT LOCATION AND ROUTING OF UTILITIES SHALL BE DETERMINED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON THIS PROJECT. AFTER ALL UTILITIES HAVE BEEN FIELD LOCATED, THE CONTRACTOR SHALL EXCAVATE AND EXPOSE ALL UTILITIES WHICH MAY BE IN CONFLICT WITH PROPOSED FACILITIES. LOCATION AND ELEVATION SHALL BE ACCURATELY MEASURED. ANY APPARENT CONFLICT BETWEEN EXISTING AND PROPOSED FACILITIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER. THE CONTRACTOR SHALL OBTAIN WRITTEN DIRECTIONS ON HOW TO PROCEED BEFORE BEGINNING ANY FURTHER EXCAVATION OR CONSTRUCTION. FAILURE TO FULLY COMPLY WITH THIS PROVISION WILL RESULT IN THE CONTRACTOR ASSUMING ALL RESPONSIBILITY AND COST OF UTILITY RELOCATION IN CASES OF CONFLICT.
4. ALL REQUIRED UTILITIES FOR THE CONTRACTOR'S STAGING AREA SHALL BE ARRANGED FOR BY THE CONTRACTOR AT HIS/HER SOLE EXPENSE. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY POLES, LINES, PIPES, METERS, ETC. TO BRING THE SERVICES FROM EXISTING SOURCES TO THE AREA AS NECESSARY. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY AGENCIES. ALL UTILITY ARRANGEMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL HAVE ALL UTILITIES DISCONNECTED AND SHALL REMOVE ALL TEMPORARY POLES, PIPES, METERS, ETC. AND RESTORE THE AREAS TO THEIR PREVIOUS CONDITION OR BETTER.
5. ANY UTILITIES DAMAGED OR BROKEN BY THE CONTRACTOR WILL BE REPAIRED BY THE CONTRACTOR AT HIS/HER SOLE EXPENSE. EACH CONTRACTOR INVOLVED SHALL ASSUME ALL LIABILITY, FINANCIAL OR OTHERWISE, IN CONNECTION WITH THE CONTRACT AND APPLICABLE SUB-CONTRACTS AND SHALL PROTECT AND SAVE HARMLESS THE OWNER FROM ANY AND ALL DAMAGES OR CLAIMS THAT MAY ARISE BECAUSE OF INCONVENIENCES, DELAYS, LOSS OF SERVICE OR INCOME EXPERIENCED BY UTILITY SERVICE PROVIDERS OR TENANT OPERATIONS.

SUPERVISION

1. THE CONTRACTOR SHALL HAVE AT ALL TIMES ON SITE, WHILE WORK IS IN PROGRESS, A JOB SUPERINTENDENT/FOREMAN. THIS PERSON SHALL BE FAMILIAR WITH ALL TYPES OF CONSTRUCTION BEING PERFORMED AND SHALL BE THE SAME PERSON EACH DAY THROUGHOUT THE PROJECT. THE SUPERINTENDENT/FOREMAN SHALL HAVE THE RESPONSIBILITY OF COORDINATING EACH DAYS WORK WITH THE ENGINEER AND SHALL HAVE AUTHORITY TO SCHEDULE AND ADJUST ALL WORKERS, PRIME AND SUBCONTRACTORS, TO ACCOMMODATE OPERATION AS DIRECTED BY THE ENGINEER AND/OR OWNER.

GENERAL DEMOLITION NOTES:

1. ANY MATERIAL BEING DEMOLISHED SHALL BE REMOVED PROMPTLY (MAXIMUM 48 HOURS) AND DISPOSED OF OFF THE PROPERTY, UNLESS SPECIFICALLY CALLED FOR IN THE CONTRACT DOCUMENTS TO BE RE-USED/RECYCLED.

BID SET

Stamp:

Client:



City of Fernandina Beach

204 Ash St.

Fernandina Beach, Florida, 32034

Passero Associates

4730 Gaze Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 1418
Principal-in-Charge Andrew M. Holesko, C.E.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestage

Revisions			
No.	Date	By	Description

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GENERAL NOTES

Amelia River Waterfront
Stabilization
Parking Lots C & D

Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.

G1-4

Date

May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\G1-04_GENL-NOTE.dwg G1-5_STRC-NOTE May 07, 2021 2:57pm by EBredastage

STRUCTURAL GENERAL NOTES

LOAD CRITERIA

1. STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE (7TH EDITION)
2. DESIGN LIVE LOADS (REDUCED AS ALLOWED BY THE BUILDING CODE):
BOARDWALK: 100 PSF
CONSTRUCTION SURCHARGE
LIVE LOAD BEHIND SHEET PILE WALL 250 PSF
3. BULKHEAD SOIL DESIGN PARAMETERS:

PER PROJECT GEOTECHNICAL REPORT
4. DESIGN SNOW LOAD: N/A
5. DESIGN WIND LOADS:
ULTIMATE WIND SPEED, V 128 MPH (THREE SECOND GUST)
NOMINAL WIND SPEED, V 99 MPH (THREE SECOND GUST)
RISK CATEGORY, II D
EXPOSURE, D
INTERNAL PRESSURE COEFF GCpi, N/A

COMPONENTS AND CLADDING WIND LOADS, N/A
6. DESIGN SEISMIC LOADS ARE BASED ON THE FOLLOWING DATA: N/A

FLOOD DESIGN DATA

1. FEMA FIRM: PANEL 237 OF 510, MAP # 12089C0237G
2. FLOOD ZONE: VE (FLOOD SIDE) AE (PROTECTED SIDE)
3. BASE FLOOD ELEVATION, BFE: ZONE AE: +10.0 FT, NAVD 88
ZONE VE: +12.0 FT, NAVD 88
4. STILLWATER ELEVATION, +8.8 FT, NAVD 88
1% ANNUAL CHANCE:
5. TOP OF SEAWALL: +9.0 FT, NAVD 88

GENERAL FOUNDATION AND BULKHEAD WALL NOTES

1. BULKHEAD WALLS SHALL CONSIST OF FIBER REINFORCED POLYMER (FRP) SHEET PILES OR TREATED TIMBER PILING, WITH TIEBACK AND DEADMAN ANCHORAGE, DRIVEN TO DEPTHS INDICATED.
2. DESIGN IS BASED ON RECOMMENDATIONS FOUND IN THE PROJECT GEOTECHNICAL REPORT BY ECS FLORIDA, LLC TITLED "GEOTECHNICAL ENGINEERING REPORT -FHB RIVERFRONT", DATED MARCH 31, 2020.
3. CONTRACTOR SHALL EMPLOY A GEOTECHNICAL ENGINEER FOR SPECIAL INSPECTIONS AND OBSERVATIONS TO PROVIDE CONTINUOUS OBSERVATION TO CONFIRM THE ENCOUNTERED SOILS AND PILE DRIVING CONDITONS ARE IN ACCORDANCE WITH RECOMMENDATIONS PROVIDED IN THE PROJECT GEOTECHNICAL REPORT. IF DIFFERENT CONDITIONS ARE ENCOUNTERED, THE GEOTECHNICAL ENGINEER SHALL PROVIDE REVISED RECOMMENDATIONS FOR DESIGN OF THE BULKHEAD WALLS.
4. CONTRACTORS SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, ELEVATIONS, ETC., IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION OR SHOP DRAWINGS.
5. THE DRAWINGS ARE INTENDED TO REQUIRE AND TO INCLUDE ALL LABOR, MATERIAL AND EQUIPMENT PROPER FOR THE WORK.
6. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODES AND REQUIREMENTS.
7. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND SAFETY PROCEDURES. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR THEIR AGENTS OR EMPLOYEES OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK.
8. OBSERVE ALL OSHA AND OTHER APPLICABLE SAFETY REQUIREMENTS INCLUDING THE USE OF SAFETY GLASSES, HARD HATS, AND PROTECTION OF AREA WHEN WORKING OVERHEAD. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR CONSTRUCTION SAFETY AT ALL TIMES.
9. THE CONTRACTOR SHALL DESIGN AND PROVIDE ANY TEMPORARY SHORING, BRACING, ETC., AS NEEDED FOR THE WORK SO AS NOT TO ENDANGER THE STRUCTURAL INTEGRITY OF ANY EXISTING FEATURE.
10. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR ANY DAMAGE DONE TO EXISTING FEATURES AS A RESULT OF THIS WORK. DAMAGED ITEMS SHALL BE REPLACED IN KIND AND AT NO ADDITIONAL COST TO THE OWNER.

FIBER REINFORCED POLYMER (FRP) SHEET PILING

1. SHEET PILE MATERIAL SHALL BE EVERLAST EVERCOMP 26.1, 8"DEEP, AS PROVIDED BY EVERLAST SYNTHETIC PRODUCTS, LLC
- a. AN APPROVED EQUAL MAY BE USED
- b. DESIGN IS BASED ON SHEET PILE PROPERTIES AS INDICATED BELOW. APPROVED EQUAL MUST MEET OR EXCEED THESE PROPERTIES.
- c. EVERCOMP 26.1 PROPERTIES:
- i. FLEXURAL STRESS:
- i. ULTIMATE: 90,000 PSI (ALONG LENGTH OF PILE)
- ii. ULTIMATE: 29,000 PSI (ALONG WIDTH OF PILE)
- iii. ALLOWABLE: 25,000 PSI (ALONG LENGTH OF PILE)
- iv. MODULUS OF ELASTICITY: 3,500,000 PSI (ALONG LENGTH OF PILE)
- v. MODULUS OF ELASTICITY: 1,900,000 PSI (ALONG WIDTH OF PILE)
- vi. MAX ALLOWABLE MOMENT: 27,000 LB-FT/FT
- b. TENSILE STRESS:
- i. ULTIMATE: 77,000 PSI (ALONG LENGTH OF PILE)
- ii. ULTIMATE: 9,000 PSI (ALONG WIDTH OF PILE)
- iii. ALLOWABLE: 25,000 PSI (ALONG LENGTH OF PILE)
- iv. MODULUS OF ELASTICITY: 5,000,000 PSI (ALONG LENGTH OF PILE)
- v. MODULUS OF ELASTICITY: 3,200,000 PSI (ALONG WIDTH OF PILE)
- c. SHEAR STRESS:
- i. ULTIMATE: 5,500 PSI (ALONG LENGTH OF PILE)
- ii. ULTIMATE: 5,400 PSI (ALONG WIDTH OF PILE)
- iii. ALLOWABLE: 2,200 PSI (ALONG LENGTH OF PILE)
- d. SECTION PROPERTIES:
- i. WIDTH: 18"
- ii. DEPTH: 8"
- iii. THICKNESS: 0.25"
- iv. SECTION MODULUS: 13 IN^3/FT
- v. MOMENT OF INERTIA: 52 IN^4/FT
- vi. RADIUS OF GYRATION: 3.29"
- vii. AREA OF WEB: 2.3 IN^2

2. MATERIALS:
- a. POLYMER (RESIN) -THE RESIN FOR THE FRP SHEET PILE SHALL EITHER BE POLYESTER OR VINYL ESTER. RESIN SHALL CONTAIN U.V. STABILIZERS TO PROVIDE SUFFICIENT RESISTANCE TO ULTRA VIOLET LIGHT DEGRADATION. NO OTHER RESINS WILL BE ACCEPTED FOR USE ON THIS PROJECT.
- b. REINFORCEMENT -THE GLASS REINFORCEMENT SHALL BE IN THE FORM OF CONTINUOUS ROVING, WOVEN ROVING OR STICHD FABRICS, AND SURFACE MATTING.
- c. THE FRP SHEET PILE SHALL BE Z-SHAPED WITH A BALL AND SOCKET INTERLOCK AND MEETING THE DIMENSIONAL TOLERANCES AS INDICATED.
- d. THE FRP SHEET PILE SHALL BE MANUFACTURED USING THE PULTRUSION PROCESS.
3. INSTALLATION:
- a. FRP SHEET PILE SHALL BE INSTALLED USING TRADITIONAL DRIVING METHODS INCLUDING VIBRATORY HAMMERS, IMPACT HAMMERS OR WATER JETS. CONTRACTOR SHALL CONTACT MANUFACTURER FOR SPECIFIC HAMMER RECOMMENDATIONS AND IS RESPONSIBLE FOR EMPLOYING THE CORRECT INSTALLATION METHOD. ANY COSTS ASSOCIATED WITH USING THE INCORRECT HAMMER METHOD IS THE RESPONSIBILITY OF THE CONTRACTOR.
- b. THE FRP SHEET PILE CAN BE CUT USING CARBIDE EDGED MASONRY BLADES AND DRILLED WITH CARBIDE OR COBALT TIPPER BITS.
- c. IF DAMAGED, THE FRP SHEET PILE MAY BE REPAIRS AS PER THE MANUFACTURER'S RECOMMENDATIONS.

CONCRETE

1. COMPLY WITH THE FOLLOWING CODES AND STANDARDS:
ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
ACI 305, ACI 306, ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
ACI DETAILING MANUAL (ACI SP-66-04)
ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"
CONCRETE REINFORCING STEEL INSTITUTE (CRSI), "MANUAL OF STANDARD PRACTICE"
ACI 304 "RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE"
2. CONCRETE STRENGTH:
ALL CONCRETE -COQUINA MIX f'c = 5000 psi
- MAX WATER/CEMENT RATIO 0.40
AIR CONTENT (%) N/A
3. MIX DESIGN REQUIREMENTS:
1. PREPARE DESIGN MIXES FOR EACH TYPE AND STRENGTH OF CONCRETE BY EITHER LABORATORY TRIAL BATCH OR FIELD EXPERIENCE METHODS AS SPECIFIED IN ACI 318/ACI 301.
2. CONCRETE SHALL BE READY MIXED PER ASTM C94. JOBSITE MIXING SHALL NOT BE PERMITTED.
2. MAXIMUM NOMINAL AGGREGATE SIZE IS ¾".
3. CONCRETE MIX SHALL INCORPORATE COQUINA COARSE AGGREGATE AND SHALL BE DESIGNED TO WITHSTAND HARSH CORROSIVE/MARINE ENVIRONMENT (ACI 318 -CONCRETE EXPOSURE LEVEL "C2")
4. MATERIALS:
1. REINFORCING BARS - ASTM A 615 GRADE 60, DEFORMED
2. PORTLAND CEMENT - ASTM C150, TYPE V (LESS THAN 5% C3A CONTENT)
3. AGGREGATE - ASTM C33
- COQUINA AGGREGATE
4. PROHIBITED ADMIXTURES -CALCIUM CHLORIDE THYOCYANATES OR ADMIXTURES CONTAINING MORE THAN 0.1% CHLORIDA IONS ARE NOT PERMITTED.
5. CONCRETE FINISH:
1. SURFACES EXPOSED TO PUBLIC VIEW: SMOOTH FORM FINISH
2. SURFACES NOT EXPOSED TO PUBLIC VIEW: ROUGH FORM FINISH
- SMOOTH FORM FINISH MUST HAVE FINS REMOVED AND A SMOOTH RUBBED FINISH APPLICATION. REFER TO ACI 301 FOR ALL OTHER FINISH DESIGNATION REQUIREMENTS.
6. REINFORCEMENT SHALL BE DETAILED AND PLACED IN ACCORDANCE WITH ACI SP-66-04. DEVELOPMENT AND SPLICE LENGTHS ARE IN TENSION UNLESS OTHERWISE INDICATED. TENSION LAP SPLICES SHALL BE AS TABULATED IN THE SPLICE LENGTH TABLE BELOW. UNLESS OTHERWISE INDICATED.
- | f'c (psi) | BAR TYPE | #3 | #4 | #5 | #6 | #7 | #8 | #9 | #10 | #11 |
|-----------|------------|----|----|----|----|----|----|----|-----|-----|
| 5000 | TOP BARS | 22 | 29 | 36 | 44 | 63 | 72 | 81 | 90 | 99 |
| 5000 | OTHER BARS | 17 | 23 | 28 | 34 | 49 | 56 | 63 | 69 | 76 |
- TOP BARS ARE HORIZONTAL REINFORCEMENT PLACED SO THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
7. CONTINUOUS REINFORCING IN WALLS AND SLABS MAY BE SPLICED, AS REQUIRED, PROVIDING BARS ARE OF THE LONGEST PRACTICABLE LENGTH AND SPLICES ARE SHOWN ON REINFORCING SHOP DRAWINGS. WHEREVER POSSIBLE, SPLICES SHALL BE STAGGERED. FIELD CUTTING OF REINFORCEMENT WILL NOT BE PERMITTED.
8. PROVIDE CONCRETE COVER FOR REINFORCING AS FOLLOWS, U.N.O.:
- ALL REINFORCING, MIN COVER: 3"
9. PROVIDE DOWELS TO MATCH REINFORCEMENT SIZE AND SPACING INDICATED FOR ALL STRUCTURAL ELEMENTS, UNLESS OTHERWISE INDICATED.
10. MAJOR CONSTRUCTION JOINTS ARE SHOWN ON THE DRAWINGS. INTERMEDIATE JOINTS IN WALLS AND SLABS ARE NOT SHOWN. CONSTRUCTION JOINTS MAY BE ADDED, OMITTED OR RELOCATED IF PROPERLY DETAILED ON SHOP DRAWINGS AND APPROVED BY THE OWNER'S REPRESENTATIVE.
11. PLACING OF REINFORCEMENT: PROVIDE CHAIRS, BOLSTERS, ADDITIONAL REINFORCEMENT, AND ACCESSORIES NECESSARY TO SUPPORT REINFORCEMENT AT POSITION SHOWN ON DRAWINGS. SUPPORT OF REINFORCEMENT ON FORM TIES, WOOD, BRICK, BRICKBAT OR OTHER UNACCEPTABLE MATERIAL, WILL NOT BE PERMITTED.
12. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS FOR SIZE AND LOCATION OF ALL EMBEDDED ITEMS, SLEEVES, SLAB DEPRESSIONS, OPENINGS, ETC. REQUIRED BY OTHER TRADES. RECONCILE THEIR EXACT SIZES AND LOCATIONS BEFORE PROCEEDING WITH THE WORK. ALL ITEMS SHALL BE FURNISHED AND INSTALLED PRIOR TO PLACEMENT OF CONCRETE. SECURE THE APPROVAL OF THE OWNER'S REPRESENTATIVE PRIOR TO PLACING OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
13. PROVIDE CONTROL JOINTS IN CAST-IN-PLACE CONCRETE SLABS-ON-GRADE AT 12 FEET O.C. MAX. LOCATE CONTROL JOINTS TO FORM APPROXIMATE SQUARE PANELS WITH THE LENGTH OF ONE SIDE NOT EXCEEDING THE ADJACENT SIDE BY A FACTOR OF 1.5. CONTROL JOINTS MAY BE CONTRACTION JOINTS, CONSTRUCTION JOINTS, OR EXPANSION JOINTS.
14. CHAMFER EDGES OF PERMANENTLY EXPOSED CONCRETE SURFACES 3/4-INCH, UNO.
15. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING WHEN IT IS SAFE TO REMOVE FORMS AND/OR SHORING. FORMS AND SHORING MUST NOT BE REMOVED UNTIL THE CONCRETE IS STRONG ENOUGH TO CARRY ITS OWN WEIGHT AND ANY ANTICIPATED SUPERIMPOSED LOADS. WHEN FORMS ARE STRIPPED THERE MUST BE NO EXCESSIVE DEFLECTION, DISTORTION, DISCOLORATION, AND NO EVIDENCE OF DAMAGE TO THE CONCRETE.

WOOD

1. FRAMING LUMBER SHALL BE AS FOLLOWS:
- ALL LUMBER (U.N.O.): SOUTHERN PINE, MARINE GRADE
BULKHEAD SHEETING: SOUTHER PINE, SEAWALL GRADE
2. LUMBER: NOMINAL SIZES ARE INDICATED, EXCEPT AS SHOWN BY DETAIL DIMENSIONS. PROVIDE DRESSED LUMBER, S4S, UNLESS NOTED OTHERWISE. BULKHEAD SHEETING LUMBER SHALL BE PROVIDED WITH SLOPPY V -T&G OR SQUARE T&G PROFILES. PROVIDE LUMBER WITH 19 PERCENT MOISTURE CONTENT, KILN DRIED AFTER TREATMENT (KDAT). TIMBERS GREATER THAN 5"IN THICKNESS MUST BE LESS THAN 25 PERCENT MOISTURE CONTENT, KDAT.
3. ALL LUMBER SHALL BE PRESSURE PRESERVATIVE TREATED AS FOLLOWS:
- AWPA U1 - USE CATEGORY -UC5C: MARINE USE, SOUTHERN WATERS
- ALL FIELD CUTS TO LUMBER/TIMBERS MUST BE COATED/DIPPED/BRUSHED WITH COPPER NAPHTHENATE PRIOR TO INSTALLATION, IN ACCORDANCE WITH AWPA STANDARD M4
4. WHERE NOT OTHERWISE SHOWN ON PLANS, ALL NAILING OR SCREWING SHALL BE AS INDICATED IN THE BUILDING CODE. ALL SHEATHING MUST BE NAILED. ADHESIVES SHALL NOT BE USED IN PLACE OF NAILING.
5. ALL FASTENERS USED SHALL BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL.
6. METAL CONNECTORS TO BE PROVIDED BY 'SIMPSON STRONG-TIE' OR EQUIVALENT.

SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS WILL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE CHAPTER 17.
2. OWNER, OR ARCHITECT/STRUCTURAL ENGINEER OF RECORD ACTING AS THE OWNER'S AGENT, SHALL DIRECTLY EMPLOY AND PAY FOR SERVICES OF THE SPECIAL INSPECTORS TO PERFORM REQUIRED SPECIAL INSPECTIONS.
3. THE FOLLOWING GENERAL TYPES OF WORK REQUIRE SPECIAL INSPECTION: REFER TO FLORIDA BUILDING CODE CHAPTER 17 FOR DETAILED INSPECTION REQUIREMENTS

FOUNDATIONS/PILING
CONCRETE
REINFORCING STEEL
FORMWORK
POST-INSTALLED CONCRETE ANCHORS

BID SET

Stamp:

Client:



City of Fernandina Beach

204 Ash St.

Fernandina Beach, Florida, 32034

Passero Associates

4120 Casa Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 3428
Principal-in-Charge Andrew N. Holesko, C.E.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredastage

Revisions			
No.	Date	By	Description

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STRUCTURAL
NOTES

Amelia River Waterfront
Stabilization
Parking Lots C & D

Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
G1-5

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\G1-04_GENL-NOTE.dwg GI-6_PLINT-NOTE May 07, 2021 2:56pm by: EBredestage

SEA TURTLE AND SHORTHOSED STURGEON
CONSTRUCTION CONDITIONS

THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING PROTECTED SPECIES CONSTRUCTION CONDITIONS:

1. THE PERMITTEE SHALL INSTRUCT ALL PERSONNEL ASSOCIATED WITH THE PROJECT OF THE POTENTIAL PRESENCE OF THESE SPECIES AND THE NEED TO AVOID COLLISIONS WITH SEA TURTLES AND SHORTHOSED STURGEON. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF THESE SPECIES.
2. THE PERMITTEE SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING SEA TURTLES OR SHORTHOSED STURGEON, WHICH ARE PROTECTED UNDER THE ENDANGERED SPECIES ACT OF 1973.
3. SILTATION BARRIERS SHALL BE MADE OF MATERIAL IN WHICH A SEA TURTLE OR SHORTHOSED STURGEON CANNOT BECOME ENTANGLED, BE PROPERLY SECURED, AND BE REGULARLY MONITORED TO AVOID PROTECTED SPECIES ENTRAPMENT. BARRIERS MAY NOT BLOCK SEA TURTLE OR SHORTHOSED STURGEON ENTRY TO OR EXIT FROM DESIGNATED CRITICAL HABITAT WITHOUT PRIOR AGREEMENT FROM THE NATIONAL MARINE FISHERIES SERVICE'S PROTECTED RESOURCES DIVISION, ST. PETERSBURG, FLORIDA.
4. ALL VESSELS ASSOCIATED WITH THE CONSTRUCTION PROJECT SHALL OPERATE AT "NO WAKE/IDLE" SPEEDS AT ALL TIMES WHILE IN THE CONSTRUCTION AREA AND WHILE IN WATER DEPTHS WHERE THE DRAFT OF THE VESSEL PROVIDES LESS THAN A FOUR-FOOT CLEARANCE FROM THE BOTTOM. ALL VESSELS WILL PREFERENTIALLY FOLLOW DEEP-WATER ROUTES (E.G., MARKED CHANNELS) WHENEVER POSSIBLE.
5. IF A SEA TURTLE OR SHORTHOSED STURGEON IS SEEN WITHIN 100 YARDS OF THE ACTIVE DAILY CONSTRUCTION/DREDGING OPERATION OR VESSEL MOVEMENT, ALL APPROPRIATE PRECAUTIONS SHALL BE IMPLEMENTED TO ENSURE ITS PROTECTION. THESE PRECAUTIONS SHALL INCLUDE CESSATION OF OPERATION OF ANY MOVING EQUIPMENT CLOSER THAN 50 FEET OF A SEA TURTLE OR SHORTHOSED STURGEON. OPERATION OF ANY MECHANICAL CONSTRUCTION EQUIPMENT SHALL CEASE IMMEDIATELY IF A SEA TURTLE OR SHORTHOSED STURGEON IS SEEN WITHIN A 50-FT RADIUS OF THE EQUIPMENT. ACTIVITIES MAY NOT RESUME UNTIL THE PROTECTED SPECIES HAS DEPARTED THE PROJECT AREA OF ITS OWN VOLITION.
6. ANY COLLISION WITH AND/OR INJURY TO A SEA TURTLE OR SHORTHOSED STURGEON SHALL BE REPORTED IMMEDIATELY TO THE NATIONAL MARINE FISHERIES SERVICE'S PROTECTED RESOURCES DIVISION (727-824- 5312) AND THE LOCAL AUTHORIZED SEA TURTLE STRANDING/RESCUE ORGANIZATION.
7. ANY SPECIAL CONSTRUCTION CONDITIONS, REQUIRED OF YOUR SPECIFIC PROJECT, OUTSIDE THESE GENERAL CONDITIONS, IF APPLICABLE, WILL BE ADDRESSED IN THE PRIMARY CONSULTATION.

SEA TURTLE AND SMALLTOOTH SAWFISH
CONSTRUCTION CONDITIONS

THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING PROTECTED SPECIES CONSTRUCTION CONDITIONS:

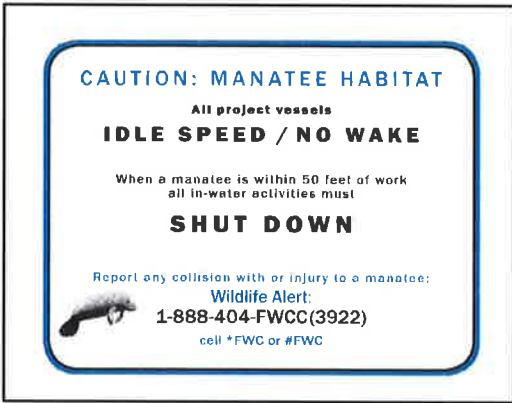
- A. THE PERMITTEE SHALL INSTRUCT ALL PERSONNEL ASSOCIATED WITH THE PROJECT OF THE POTENTIAL PRESENCE OF THESE SPECIES AND THE NEED TO AVOID COLLISIONS WITH SEA TURTLES AND SMALLTOOTH SAWFISH. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF THESE SPECIES.
- B. THE PERMITTEE SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING SEA TURTLES OR SMALLTOOTH SAWFISH, WHICH ARE PROTECTED UNDER THE ENDANGERED SPECIES ACT OF 1973.
- C. SILTATION BARRIERS SHALL BE MADE OF MATERIAL IN WHICH A SEA TURTLE OR SMALLTOOTH SAWFISH CANNOT BECOME ENTANGLED, BE PROPERLY SECURED, AND BE REGULARLY MONITORED TO AVOID PROTECTED SPECIES ENTRAPMENT. BARRIERS MAY NOT BLOCK SEA TURTLE OR SMALLTOOTH SAWFISH ENTRY TO OR EXIT FROM DESIGNATED CRITICAL HABITAT WITHOUT PRIOR AGREEMENT FROM THE NATIONAL MARINE FISHERIES SERVICE'S PROTECTED RESOURCES DIVISION, ST. PETERSBURG, FLORIDA.
- D. ALL VESSELS ASSOCIATED WITH THE CONSTRUCTION PROJECT SHALL OPERATE AT "NO WAKE/IDLE" SPEEDS AT ALL TIMES WHILE IN THE CONSTRUCTION AREA AND WHILE IN WATER DEPTHS WHERE THE DRAFT OF THE VESSEL PROVIDES LESS THAN A FOUR-FOOT CLEARANCE FROM THE BOTTOM. ALL VESSELS WILL PREFERENTIALLY FOLLOW DEEP-WATER ROUTES (E.G., MARKED CHANNELS) WHENEVER POSSIBLE.
- E. IF A SEA TURTLE OR SMALLTOOTH SAWFISH IS SEEN WITHIN 100 YARDS OF THE ACTIVE DAILY CONSTRUCTION/DREDGING OPERATION OR VESSEL MOVEMENT, ALL APPROPRIATE PRECAUTIONS SHALL BE IMPLEMENTED TO ENSURE ITS PROTECTION. THESE PRECAUTIONS SHALL INCLUDE CESSATION OF OPERATION OF ANY MOVING EQUIPMENT CLOSER THAN 50 FEET OF A SEA TURTLE OR SMALLTOOTH SAWFISH. OPERATION OF ANY MECHANICAL CONSTRUCTION EQUIPMENT SHALL CEASE IMMEDIATELY IF A SEA TURTLE OR SMALLTOOTH SAWFISH IS SEEN WITHIN A 50-FT RADIUS OF THE EQUIPMENT. ACTIVITIES MAY NOT RESUME UNTIL THE PROTECTED SPECIES HAS DEPARTED THE PROJECT AREA OF ITS OWN VOLITION.
- F. ANY COLLISION WITH AND/OR INJURY TO A SEA TURTLE OR SMALLTOOTH SAWFISH SHALL BE REPORTED IMMEDIATELY TO THE NATIONAL MARINE FISHERIES SERVICE'S PROTECTED RESOURCES DIVISION (727-824- 5312) AND THE LOCAL AUTHORIZED SEA TURTLE STRANDING/RESCUE ORGANIZATION.
- G. ANY SPECIAL CONSTRUCTION CONDITIONS, REQUIRED OF YOUR SPECIFIC PROJECT, OUTSIDE THESE GENERAL CONDITIONS, IF APPLICABLE, WILL BE ADDRESSED IN THE PRIMARY CONSULTATION.

REVISED: MARCH 23, 2006
O:\FORMS\SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS.DOC

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK
2011

THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING CONDITIONS INTENDED TO PROTECT MANATEES FROM DIRECT PROJECT EFFECTS:

- A. ALL PERSONNEL ASSOCIATED WITH THE PROJECT SHALL BE INSTRUCTED ABOUT THE PRESENCE OF MANATEES AND MANATEE SPEED ZONES, AND THE NEED TO AVOID COLLISIONS WITH AND INJURY TO MANATEES. THE PERMITTEE SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING MANATEES WHICH ARE PROTECTED UNDER THE MARINE MAMMAL PROTECTION ACT, THE ENDANGERED SPECIES ACT, AND THE FLORIDA MANATEE SANCTUARY ACT.
- B. ALL VESSELS ASSOCIATED WITH THE CONSTRUCTION PROJECT SHALL OPERATE AT "IDLE SPEED/NO WAKE" AT ALL TIMES WHILE IN THE IMMEDIATE AREA AND WHILE IN WATER WHERE THE DRAFT OF THE VESSEL PROVIDES LESS THAN A FOUR-FOOT CLEARANCE FROM THE BOTTOM. ALL VESSELS WILL FOLLOW ROUTES OF DEEP WATER WHENEVER POSSIBLE.
- C. SILTATION OR TURBIDITY BARRIERS SHALL BE MADE OF MATERIAL IN WHICH MANATEES CANNOT BECOME ENTANGLED, SHALL BE PROPERLY SECURED, AND SHALL BE REGULARLY MONITORED TO AVOID MANATEE ENTANGLEMENT OR ENTRAPMENT. BARRIERS MUST NOT IMPEDE MANATEE MOVEMENT.
- D. ALL ON-SITE PROJECT PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF MANATEE(S). ALL IN-WATER OPERATIONS, INCLUDING VESSELS, MUST BE SHUTDOWN IF A MANATEE(S) COMES WITHIN 50 FEET OF THE OPERATION. ACTIVITIES WILL NOT RESUME UNTIL THE MANATEE(S) HAS MOVED BEYOND THE 50-FOOT RADIUS OF THE PROJECT OPERATION, OR UNTIL 30 MINUTES ELAPSES IF THE MANATEE(S) HAS NOT REAPPEARED WITHIN 50 FEET OF THE OPERATION. ANIMALS MUST NOT BE HERDED AWAY OR HARASSED INTO LEAVING.
- E. ANY COLLISION WITH OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FWC) HOTLINE AT 1-888-404-3922. COLLISION AND/OR INJURY SHOULD ALSO BE REPORTED TO THE U.S. FISH AND WILDLIFE SERVICE IN JACKSONVILLE (1-904-731-3336) FOR NORTH FLORIDA OR VERO BEACH (1-772-562-3909) FOR SOUTH FLORIDA, AND TO FWC AT Imperiledspecies@MYFWC.COM
- F. TEMPORARY SIGNS CONCERNING MANATEES SHALL BE POSTED PRIOR TO AND DURING ALL IN-WATER PROJECT ACTIVITIES. ALL SIGNS ARE TO BE REMOVED BY THE PERMITTEE UPON COMPLETION OF THE PROJECT. TEMPORARY SIGNS THAT HAVE ALREADY BEEN APPROVED FOR THIS USE BY THE FWC MUST BE USED. ONE SIGN WHICH READS CAUTION: BOATERS MUST BE POSTED. A SECOND SIGN MEASURING AT LEAST 8 1/2" BY 11" EXPLAINING THE REQUIREMENTS FOR IDLE SPEED/NO WAKE AND THE SHUT DOWN OF IN-WATER OPERATIONS MUST BE POSTED IN A LOCATION PROMINENTLY VISIBLE TO ALL PERSONNEL ENGAGED IN WATER-RELATED ACTIVITIES. THESE SIGNS CAN BE VIEWED AT MYFWC.COM/MANATEE. QUESTIONS CONCERNING THESE SIGNS CAN BE SENT TO THE EMAIL ADDRESS LISTED ABOVE.



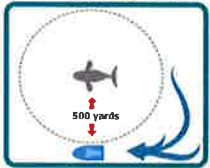
North Atlantic Right Whale Information Form
Federal Regulations Governing the Approach to North Atlantic Right Whales



1. Federal regulations governing the approach to North Atlantic right whales can be found at 50 CFR 224.103(c). It is illegal to approach and remain within 500 yards of right whales; 500 yards is equal to the distance of 5 football fields.

Prohibitions on approaching right whales are as follows (Excerpts from 50 CFR 224.103(c), available at www.ecfr.gov): Unless otherwise lawfully allowed or unless doing so would create an imminent and serious threat to a person or vessel, it is unlawful to:

- (i) Approach (including by interception) within 500 yards (460 m) of a right whale by vessel
- (ii) Fail to undertake required right whale avoidance measures. If underway, a vessel must steer a course away from the right whale and immediately leave the area at a slow safe speed.



2. Updates can be downloaded from:
 - a. http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/rightwhale_northatlantic.htm, or
 - b. www.ecfr.gov

PLANTING NOTES

1. THE CONTRACTOR SHALL MAINTAIN TEMPORARY EROSION CONTROL MEASURES DURING CONSTRUCTION IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
2. THE CONTRACTOR SHALL ACQUAINT HIMSELF WITH THE MITIGATION PLANS, SITE PAVING, GRADING, AND UTILITY PLANS IN THE VICINITY OF THE MITIGATION AREA IN ORDER TO PRECLUDE ANY MISUNDERSTANDINGS OR POTENTIAL CONFLICTS. ALL DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER OR HIS DESIGNEE.
3. THE CONTRACTOR SHALL OBTAIN COPIES OF PERMITS ISSUED BY THE U.S. ARMY CORPS OF ENGINEERS, ST JOHNS RIVER WATER MANAGEMENT DISTRICT, AND NASSAU COUNTY. THE PROJECT SHALL BE IN CONFORMANCE WITH CONDITIONS SPECIFIED IN THOSE PERMITS.
4. PRIOR TO PLANTING AND UPON COMPLETION OF THE MITIGATION AREA, THE CONTRACTOR SHALL REVIEW THE AS-BUILT DATA TO ENSURE THAT PROPER GRADE ELEVATIONS, ORGANIC SOIL LAYER, AND WATER LEVELS ARE AS SPECIFIED.
5. THE INTENT OF THESE PLANS IS TO PROVIDE GUIDELINES FOR PLANTING HERBACEOUS PLANTS BASED ON THEIR GENERAL HYDROLOGIC REQUIREMENTS (ZONATION). IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW FIELD CONDITIONS PRIOR TO PLANTING AND TO CALL TO THE ATTENTION OF THE ENGINEER ANY ADJUSTMENT OF LOCATION OR ELEVATION OF A PLANT SPECIES TO MATCH AS-BUILT FIELD ELEVATIONS AND CONDITIONS, IN ORDER TO GUARANTEE SURVIVAL OF THE PLANTED SPECIES AS SPECIFIED IN THE ABOVE REFERENCE PERMITS.
6. THE WORK CONSISTS OF THE COMPLETE PLANT MATERIALS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED. THIS WORK SHALL INCLUDE THE FURNISHING OF ALL LABOR, EQUIPMENT, MATERIALS, AND APPLIANCES REQUIRED FOR THE INSTALLATION AS SHOWN ON THE PLANS. THE WORK SHALL ALSO INCLUDE THE MAINTAINING OF ALL THE PLANTS AND PLANTING AREAS UNTIL ACCEPTANCE BY THE OWNER, AND FULFILLING OF ALL GUARANTEE PROVISIONS AS SPECIFIED.
7. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING ADDITIONAL MATERIALS FOR PLANTING:
 - A. BACKFILL FOR HERBACEOUS PLANTS IN MITIGATION AREA.
 - B. 14-14-14 TIME RELEASE FERTILIZER. FERTILIZER IS TO BE MIXED WITH BACKFILL WHEN INSTALLING PLANTS.
8. PLANT MATERIAL SHALL BE INSTALLED NO LATER THAN 24 HOURS AFTER DELIVERY TO THE SITE. IF NECESSARY FOR TEMPORARY STORAGE PURPOSES, PLANTS SHOULD BE KEPT MOIST AND IN A SHADED AREA WHILE ON SITE.
9. PRIOR TO DELIVERY TO THE SITE, ALL PLANTS TO BE INSTALLED IN INUNDATED CONDITIONS MUST BE WATER HARDENED AT LEAST 30 DAYS PRIOR TO INSTALLATION.
10. ALL PLANT MATERIAL OBTAINED FROM NURSERY STOCK SHALL BE FLORIDA GRADE NO. 1 OR BETTER, AS SPECIFIED IN GRADES AND STANDARDS FOR NURSERY PLANTS, PARTS I AND II BY DIVISION OF PLANT INDUSTRY, FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, AND SHALL CONFORM TO CURRENT AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS FOR NURSERY STOCK.
11. ALL PLANTS SHALL BE OF THE SIZES AS CALLED FOR ON THE MATERIALS SCHEDULE. ANY PLANT MATERIAL, DETERMINED BY THE ENGINEER OR HIS DESIGNEE AS NOT MEETING THE SIZES AND QUALITY AS CALLED FOR, SHALL BE REMOVED FROM THE SITE AND REPLACED AT NO ADDITIONAL COST.
12. THE QUANTITIES SHOWN ON THE CONTRACT DOCUMENTS ARE INTENDED AS A GUIDE TO THE CONTRACTOR WITH THE PREPARATION OF HIS BID. THE CONTRACTOR AGREES THAT HE HAS VERIFIED THE QUANTITIES AND HAS REVISED THEM, IF NECESSARY, PRIOR TO SUBMISSION OF HIS BID. THE CONTRACTOR FURTHER AGREES THAT NO ADDITIONAL COMPENSATION WILL BE MADE FOR INCORRECT QUANTITIES.
13. PLANTS WILL BE INSTALLED AT ELEVATIONS MOST CONDUCIVE FOR THEIR DEVELOPMENT ON SHEET C3-4: TYPICAL SECTIONS. PLANTING RANGES ARE DEPICTED IN THE "TABULATION OF QUANTITIES" LIST.
14. PLANTS WILL BE INSTALLED IN RANDOM PATTERNS WITHIN THEIR APPROPRIATE ELEVATION RANGES AT THE CONTRACTOR'S DISCRETION UNLESS OTHERWISE DIRECTED BY THE PLANS.
15. GRADES AND SLOPES SHOWN MAY BE FIELD ALTERED TO ENSURE THAT WATER LEVELS WILL BE ACHIEVED WHICH RESULT IN OPTIMAL PLANT SURVIVAL AND HABITAT VALUE. HOWEVER, GRADE CHANGES MUST BE APPROVED BY APPROPRIATE AGENCIES.
16. PLANT SIZES IN THE ARTICULATED BLOCK AREA SHALL BE 4" LINERS IN SIZE. MINIMUM PLANT SIZES WILL BE DETAILED ON DRAWINGS C2-2 THRU C2-5: STABILIZATION PLANS AND C3-4: TYPICAL SECTIONS FOR RESPECTIVE AREAS. BARE ROOT MATERIAL WILL NOT BE USED.

PAY ITEM NOTE:

COSTS ASSOCIATED WITH PLANTING ITEMS ON THIS DRAWING SHALL BE INCLUDED IN CORRESPONDING ITEMS T-910, T-912, AND T-914.

BID SET

Stamp:

Client:



City of Fernandina Beach

204 Ash St.

Fernandina Beach, Florida, 32034

Passero Associates

4370 Coral Cove Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestage

Revisions

Rev.	Date	By	Description

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**WILDLIFE
PROTECTION
NOTES AND
PLANTING
NOTES**

Amelia River Waterfront
Stabilization
Parking Lots C & D

Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

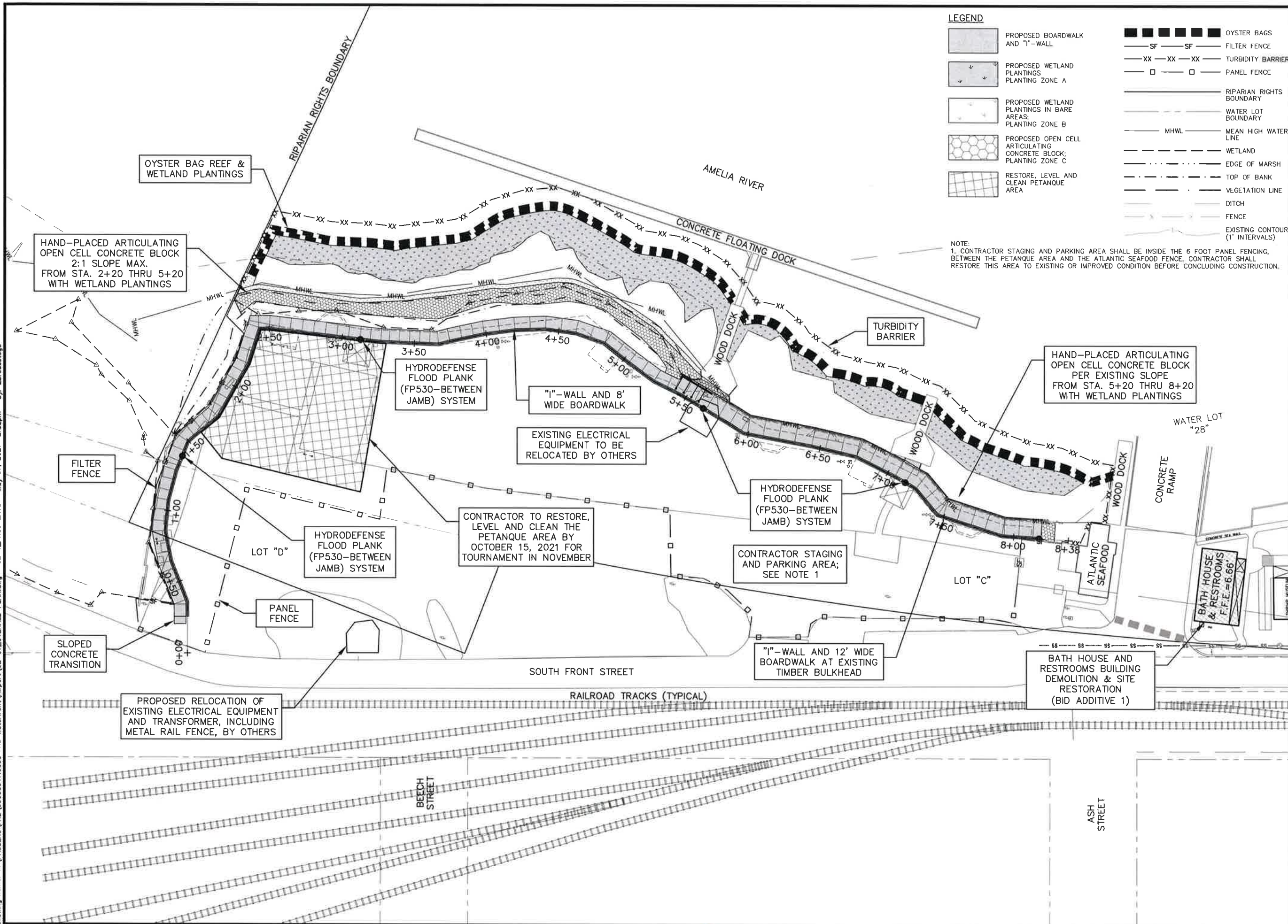
Drawing No.

G1-6

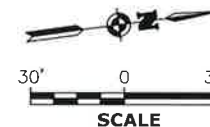
Date

May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\G2-01_OVERALL-PLAN.dwg G2-1_PROJ-LAYO May 07, 2021 2:58pm by: EBredesteg



BID SET



Stamp:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

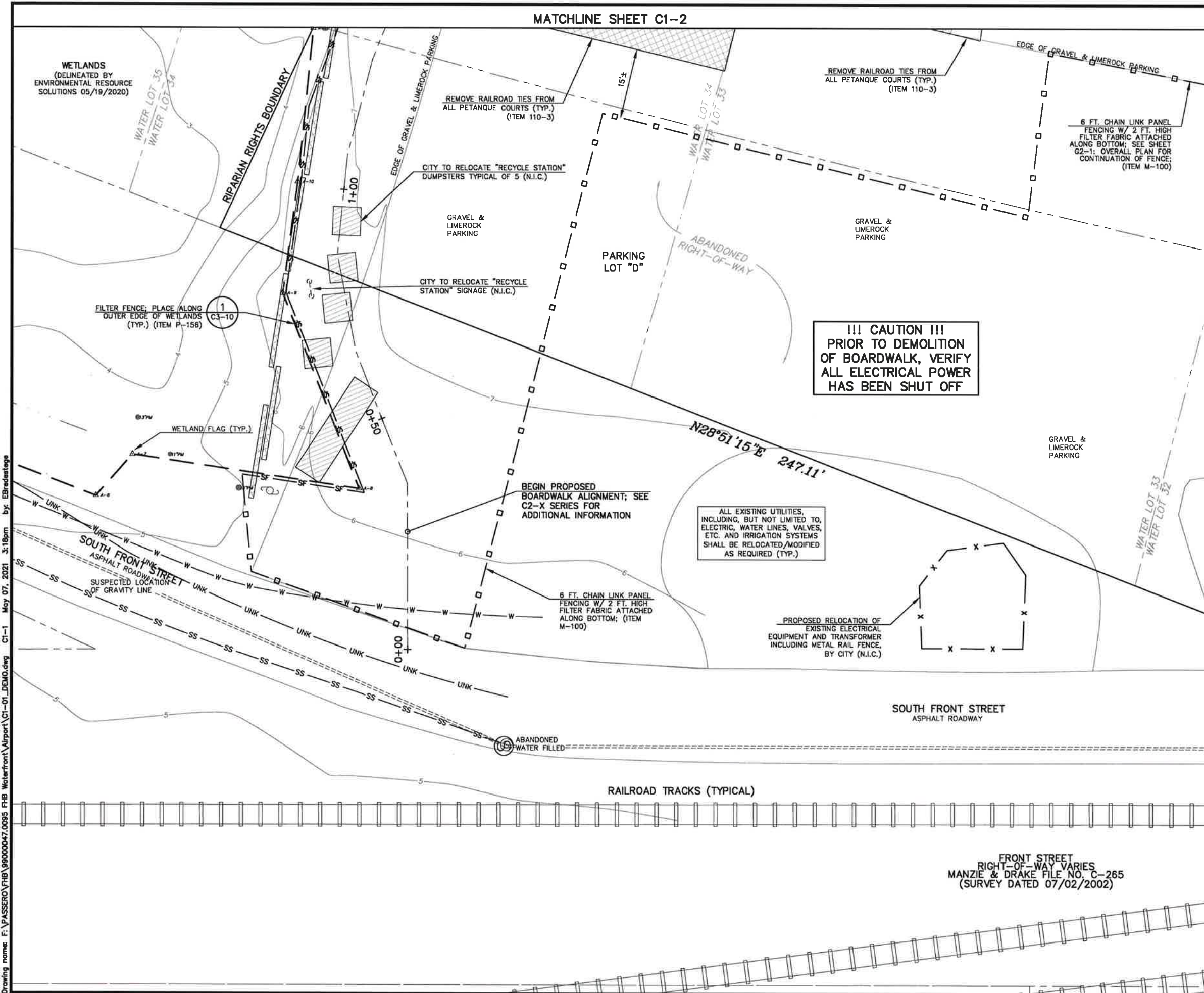
Passero Associates
4130 Coco Loop Way, Suite 200 (904) 157-6105
St. Augustine, FL 32085 Fax: (904) 157-6107
Certificate of Authorization: 9348
Principal-in-Charge: Andrew M. Holosko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredesteg

Revisions				
No.	Date	By	Designator	

OVERALL PLAN

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida
Project No.: 99000047.0095
Drawing No.: **G2-1**
Date: May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C1-01_DEMO.dwg C1-1 May 07, 2021 3:18pm by: EBredestage



LEGEND

- REMOVE EX. TIMBER BOARDWALK; DECK BOARDS & JOISTS; CONCRETE PADS & SUPPORTS; RAILINGS & POSTS; BENCHES; INCLUDING ELECTRICAL CONDUITS, JUNCTION BOXES, WIRES & LIGHT FIXTURES AS REQUIRED TO PREPARE FOR NEW WORK; ITEM 02-41-00
- REMOVE EXST. OBJECTS AS IDENTIFIED; ITEM 110-3
- CITY TO REMOVE (N.I.C.)
- SF — SF — FILTER FENCE
- XX — XX — TURBIDITY BARRIER
- — □ — CHAIN LINK PANEL FENCING; 2' HIGH FILTER FABRIC ATTACHED ALONG BOTTOM; INCLUDE
- — RIPARIAN RIGHTS BOUNDARY
- — WATER LOT BOUNDARY
- MHW — MEAN HIGH WATER LINE
- — WETLANDS LIMITS
- — EDGE OF MARSH
- — TOP OF BANK
- — VEGETATION LINE
- — DITCH
- X — X — FENCE
- — EXISTING CONTOUR (1' INTERVALS)

NOTES:

- CAUTION! PRIOR TO DEMOLITION OF BOARDWALK, VERIFY ALL ELECTRICAL POWER HAS BEEN SHUT OFF.
- THE LOCATION OF EXISTING UNDERGROUND STRUCTURES, UTILITIES, CABLES AND FOUNDATIONS AS SHOWN ON THE DRAWINGS ARE TO BE CONSIDERED AS GENERAL LOCATION ONLY AND MAY NOT INCLUDE ALL UNDERGROUND ITEMS THAT MAY BE ENCOUNTERED. THE LOCATION OR DEPTH SHOWN FOR UNDERGROUND ITEMS SHOULD ONLY BE CONSIDERED AS A GUIDE TO THE GENERAL AREA IN WHICH AN ITEM IS LOCATED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCURATELY LOCATE UNDERGROUND ITEMS BEFORE ANY WORK IS PERFORMED IN THE AREA THAT COULD DAMAGE SAME. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER PRIOR TO EXCAVATING IN ANY AREA.
- ALL EROSION CONTROL MEASURES SHALL BE IN PLACE BEFORE THE START OF CONSTRUCTION ACTIVITIES AND SHALL REMAIN IN PLACE THROUGHOUT CONSTRUCTION. INCLUDE COSTS IN ITEM P-156.
- MAINTENANCE AND PROTECTION OF TRAFFIC WORK ITEMS, INCLUDING CHAIN LINK PANEL FENCING WITH 2 FT. HIGH FILTER, SHALL BE PAID UNDER ITEM M-100.
- ALL EXISTING UTILITIES, INCLUDING, BUT NOT LIMITED TO, ELECTRIC, WATER LINES, VALVES, ETC. AND IRRIGATION SYSTEMS SHALL BE RELOCATED/MODIFIED AS REQUIRED (TYP.).
- REMOVE ALL TRASH AND DEBRIS ALONG EDGE OF PARKING LOT "D" AND WETLANDS AS REQUIRED (TYP.). INCLUDE REMOVAL AND DISPOSAL COSTS IN ITEM 110-3.
- REMOVE EXISTING TIMBER POLES; RAILROAD TIES; TRASH DEBRIS; DEAD BRANCHES AND ROOTS; INVASIVE PLANT SPECIES; BRUSHES AND TREES WITH 2" DIA. OR LESS; WITHIN THE CONSTRUCTION WORK LIMITS. INCLUDE REMOVAL AND DISPOSAL COSTS IN ITEM 110-2.
- PROTECT ALL DECIDUOUS, EVERGREEN AND PALM TREES AS REQUIRED FROM DAMAGE DURING CONSTRUCTION.
- SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE PER ADA AS REQUIRED FROM PROPOSED CONCRETE BOARDWALK AND EXISTING WOOD DOCK SURFACE; REPLACE IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL PROVIDE SHORING OF ELEMENTS TO REMAIN.
- REMOVE PORTION OF EXISTING TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD EXTENSION AND ARTICULATED CONCRETE BLOCK.
- CONTRACTOR TO RESTORE, LEVEL AND CLEAN LIME ROCK WITHIN THE PETANQUE AREA BY OCTOBER 15, 2021 FOR TOURNAMENT IN NOVEMBER.
- CONTRACTOR TO RESTORE, LEVEL AND CLEAN ALL GRASS AREAS; LAWN SEED/SOD WITHIN STAGING AREA.
- CONTRACTOR TO RESTORE, LEVEL AND CLEAN ALL PARKING AREAS; LIME ROCK WITHIN STAGING AREA.
- LIMITS OF WORK DEFINED BY TURBIDITY BARRIER, SILT FENCE AND PANEL FENCE.

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BID SET

Stamp:

Client:

CITY OF FERNANDINA BEACH
FLORIDA

City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Gaze Creek Way, Suite 200
St. Augustine, FL 32095
Principal-In-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredestage

Revisions

No.	Date	By	Description

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DEMOLITION PLAN

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

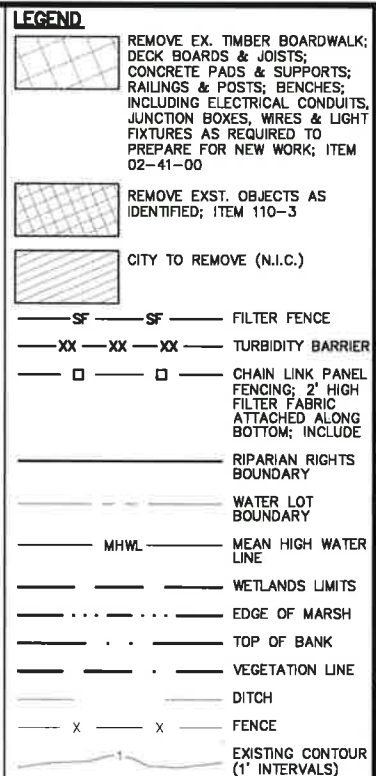
Drawing No.
C1-1

Date
May 10, 2021



8. PROTECT ALL DECIDUOUS, EVERGREEN AND PALM TREES AS REQUIRED FROM DAMAGE DURING CONSTRUCTION.
9. SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE PER ADA AS REQUIRED FROM PROPOSED CONCRETE BOARDING AND EXISTING WOOD DOCK SURFACE; REPLACE IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL. PROVIDE SHORING OF ELEMENTS TO REMAIN.
10. REMOVE PORTION OF EXISTING TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD EXTENSION AND ARTICULATED CONCRETE BLOCK.
11. CONTRACTOR TO RESTORE, LEVEL AND CLEAN LIME ROCK WITHIN THE PETANQUE AREA BY OCTOBER 15, 2021 FOR TOURNAMENT IN NOVEMBER.
12. CONTRACTOR TO RESTORE, LEVEL AND CLEAN ALL GRASS AREAS; LAWN SEED/SOD WITHIN STAGING AREA.
13. CONTRACTOR TO RESTORE, LEVEL AND CLEAN ALL PARKING AREAS; LIME ROCK WITHIN STAGING AREA.
14. LIMITS OF WORK DEFINED BY TURBIDITY BARRIER, SILT FENCE AND PANEL FENCE.

**Amelia River Waterfront
Stabilization
Parking Lots C & D**
Town/City: Fernandina Beach
County: Nassau State: Florida
Project No.
99000047.0095
Drawing No.
C1-3
Date
May 10, 2021



- NOTES:
1. CAUTION PRIOR TO DEMOLITION OF BOARDWALK, VERIFY ALL ELECTRICAL POWER HAS BEEN SHUT OFF.
2. THE LOCATION OF EXISTING UNDERGROUND STRUCTURES, UTILITIES, CABLES AND FOUNDATIONS AS SHOWN ON THE DRAWINGS ARE TO BE CONSIDERED AS GENERAL LOCATION ONLY AND MAY NOT INCLUDE ALL UNDERGROUND ITEMS THAT MAY BE ENCLOSED, THE LOCATION OR DEPTH SHOWN FOR UNDERGROUND ITEMS SHOULD ONLY BE CONSIDERED AS A GUIDE TO THE GENERAL AREA IN WHICH AN ITEM IS LOCATED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCURATELY LOCATE UNDERGROUND ITEMS BEFORE ANY WORK IS PERFORMED IN THE AREA THAT COULD DAMAGE SAME. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER PRIOR TO EXCAVATING IN ANY AREA.
3. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE BEFORE THE START OF CONSTRUCTION ACTIVITIES AND SHALL REMAIN IN PLACE THROUGHOUT CONSTRUCTION. INCLUDE COSTS IN ITEM P-156.
4. MAINTENANCE AND PROTECTION OF TRAFFIC WORK ITEMS, INCLUDING CHAIN LINK PANEL FENCING WITH 2 FT. HIGH FILTER, SHALL BE PAID UNDER ITEM M-100.
5. ALL EXISTING UTILITIES, INCLUDING, BUT NOT LIMITED TO, ELECTRIC, WATER LINES, VALVES, ETC. AND IRRIGATION SYSTEMS SHALL BE RELOCATED/MODIFIED AS REQUIRED (TYP.).

[illegible]

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DEMOLITION PLAN

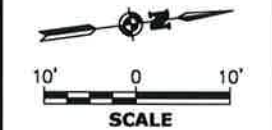
**Amelia River Waterfront
Stabilization
Parking Lots C & D**
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No. 99000047.0095

Drawing No. **C1-4**

Date _____

May 10, 2021

BID SET

Stamp: _____



City of Fernandina Beach
204 Ash St.

Fernandina Beach, Florida, 32034

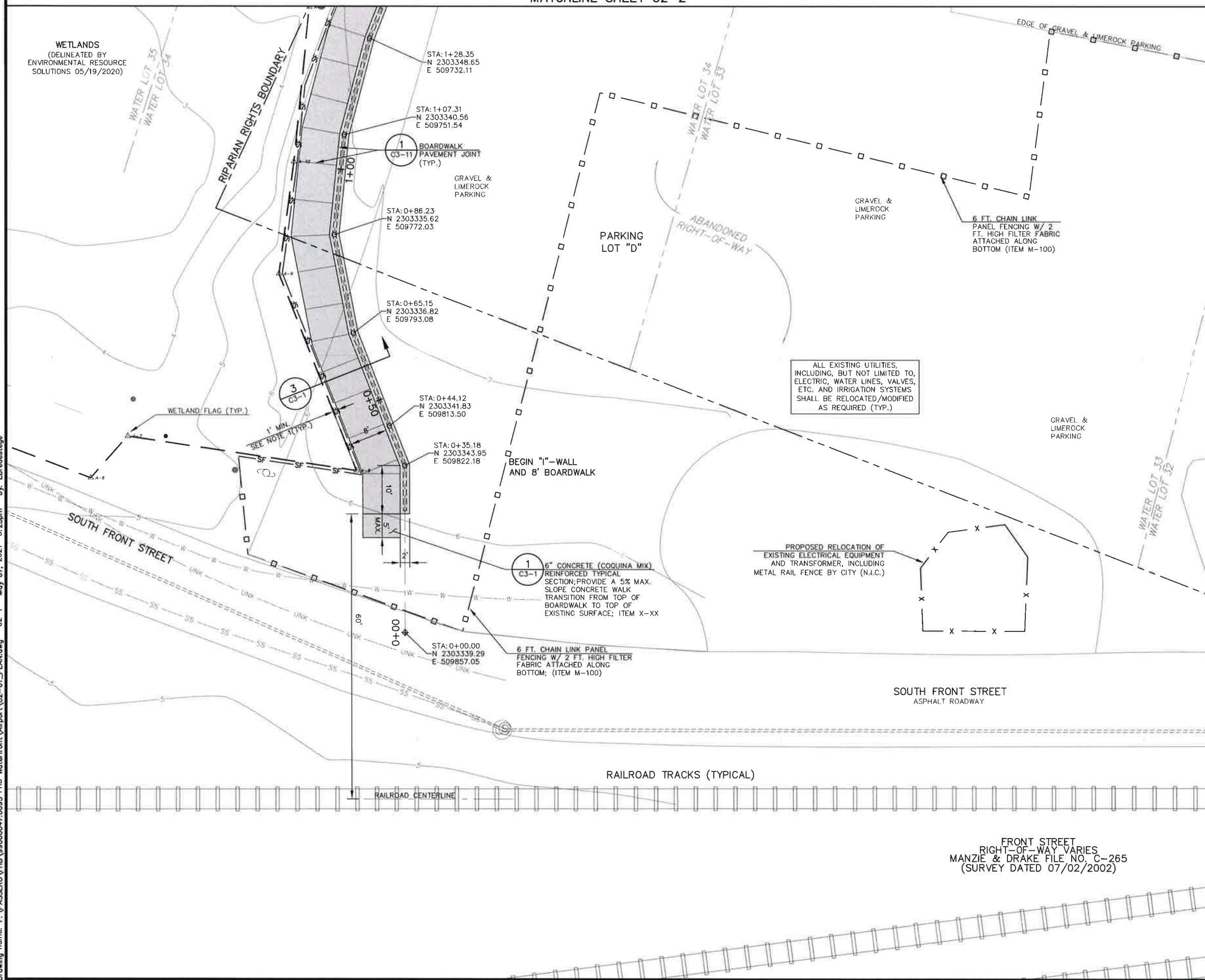
Passero Associates

4730 Cass Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 3428

Principal-In-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bradestegge

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C2-01_PLAN.dwg C2-1 May 07, 2021 3:23pm by: ERedestage

MATCHLINE SHEET C2-2



LEGEND

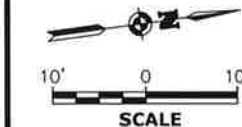
- PROPOSED BOARDWALK AND "I"-WALL 1&2 C3-1
- PROPOSED WETLAND PLANTINGS; SEE NOTE 6 BELOW; PLANTING ZONE A 3 C3-4
- PROPOSED WETLAND PLANTINGS; SEE NOTE 7 BELOW; PLANTING ZONE B 3 C3-4
- PROPOSED OPEN CELL ARTICULATING CONCRETE BLOCK W/ WETLAND PLANTINGS; PLANTING ZONE C 1 C3-5
- OYSTER BAGS
- SF SILT FENCE
- XX STAKED TURBIDITY BARRIER
- 6 FT. CHAIN LINK PANEL FENCING W/ 2 FT. HIGH FILTER FABRIC ATTACHED ALONG BOTTOM
- RIPARIAN RIGHTS BOUNDARY
- WATER LOT BOUNDARY
- MHWL MEAN HIGH WATER LINE
- WETLANDS LIMITS
- EDGE OF MARSH
- TOP OF BANK
- VEGETATION LINE
- DITCH
- FENCE
- EXISTING CONTOUR (1' INTERVALS)

NOTES

- SEE SHEET G1-5 FOR STRUCTURAL GENERAL NOTES.
- BOARDWALK EDGE SHALL BE ONE FOOT MINIMUM FROM WETLANDS BOUNDARY.
- SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE AS REQUIRED REPLACE ALL THAT IS REQUIRED IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL.
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- OYSTER BAG REEF: CONTRACTOR SHALL PROVIDE A 5 FOOT GAP EVERY 75 LINEAR FEET MAX. APPROXIMATE PREFERRED GAP LOCATIONS SHOWN ON PLANS.
- PROPOSED WETLAND PLANTINGS: CONTRACTOR SHALL PROVIDE WETLAND PLANTINGS, INCLUDING ERODED BARE AREAS AS REQUIRED FOR A UNIFORM DENSITY.
- CONTRACTOR TO PROTECT EXISTING WETLAND PLANTINGS FROM DAMAGE. ANY DAMAGE TO EXISTING WETLAND PLANTINGS SHALL BE REPLACED TO MAINTAIN DENSITY.

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BID SET



Stamp:

Client:

City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4130 Casa Cola Way, Suite 200 (904) 757-6100
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 3428
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredesteige

Revisions			
No.	Date	By	Description

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**BOARDWALK
AND
STABILIZATION
PLAN**

Amelia River Waterfront
Stabilization
Parking Lots C & D

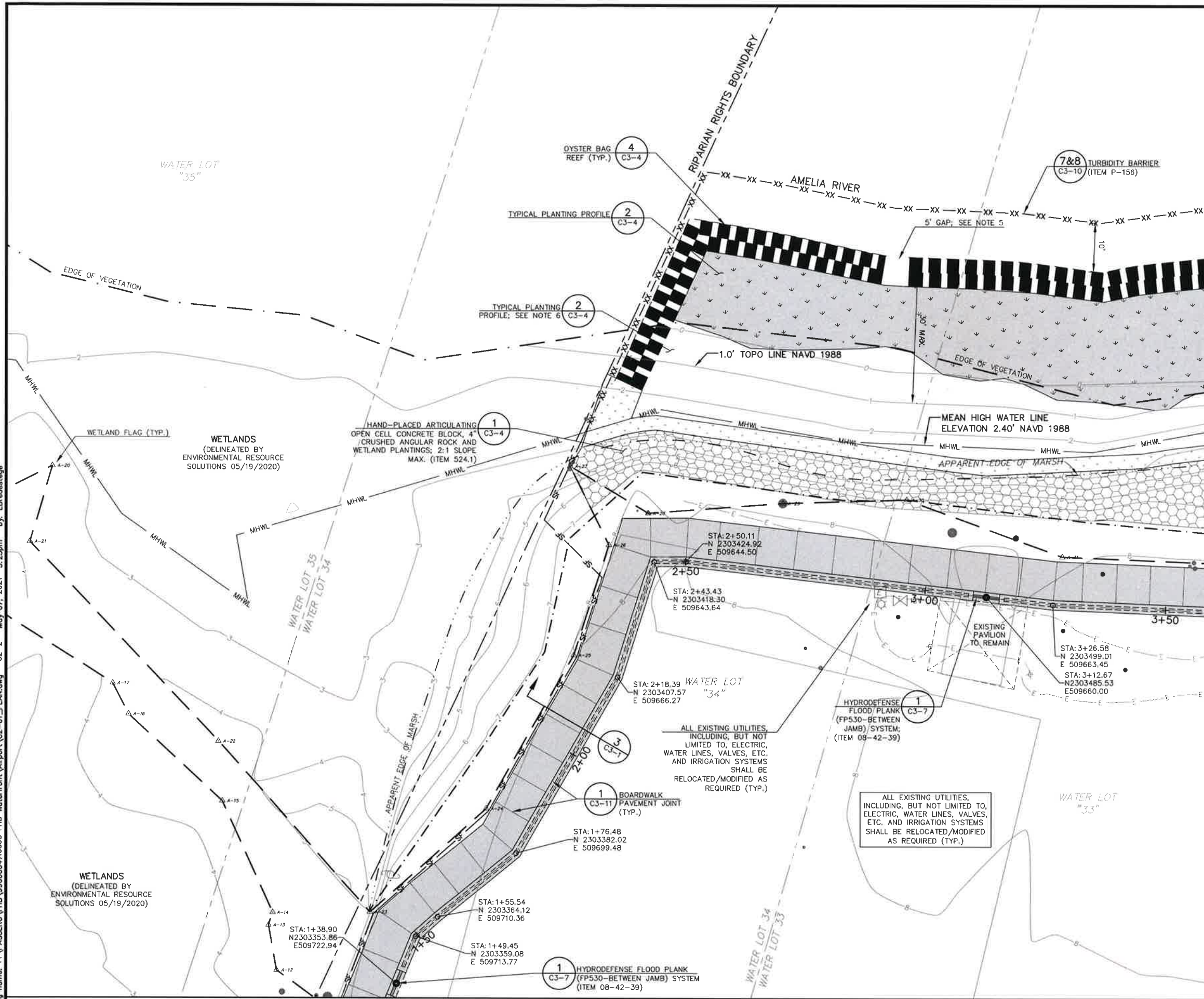
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C2-1

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C2-01_PLAN.dwg C2-2 May 07, 2021 3:23pm by: ERedesteghe



LEGEND

- PROPOSED BOARDWALK AND "I"-WALL (C3-1)
- PROPOSED WETLAND PLANTINGS; SEE NOTE 6 BELOW; PLANTING ZONE A (C3-4)
- PROPOSED WETLAND PLANTINGS; SEE NOTE 7 BELOW; PLANTING ZONE B (C3-4)
- PROPOSED OPEN CELL ARTICULATING CONCRETE BLOCK W/ WETLAND PLANTINGS; PLANTING ZONE C (C3-5)
- OYSTER BAGS
- SILT FENCE
- STAKED TURBIDITY BARRIER
- 6 FT. CHAIN LINK PANEL FENCING W/ 2 FT. HIGH FILTER FABRIC ATTACHED ALONG BOTTOM
- RIPARIAN RIGHTS BOUNDARY
- WATER LOT BOUNDARY
- MEAN HIGH WATER LINE
- WETLANDS LIMITS
- EDGE OF MARSH
- TOP OF BANK
- VEGETATION LINE
- DITCH
- FENCE
- EXISTING CONTOUR (1' INTERVALS)

- NOTES**
- SEE SHEET G1-5 FOR STRUCTURAL GENERAL NOTES.
 - BOARDWALK EDGE SHALL BE ONE FOOT MINIMUM FROM WETLANDS BOUNDARY.
 - SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER BULKHEAD AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE AS REQUIRED REPLACE ALL THAT IS REQUIRED IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL.
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Client:

CITY OF FERNANDINA BEACH
FLORIDA

City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Costa Cola Way, Suite 200 St. Augustine, FL 32095
Principal-In-Charge: Andrew M. Hollesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredesteghe

Revisions

No.	Date	By	Description

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BOARDWALK AND STABILIZATION PLAN

Amelia River Waterfront Stabilization
Parking Lots C & D

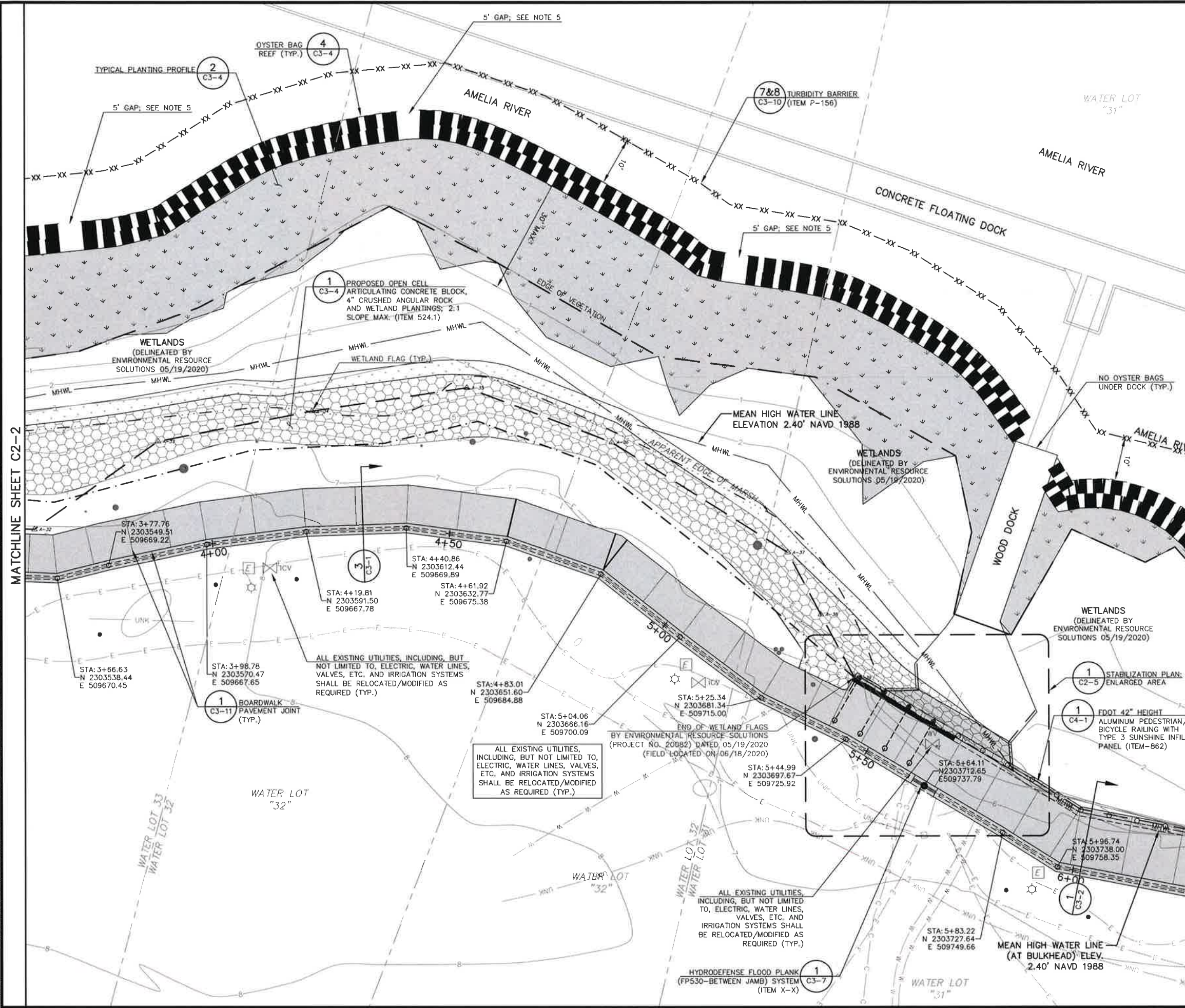
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C2-2

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C2-01_PLAN.dwg C2-3 May 07, 2021 3:23pm by: ERedestegre



LEGEND

- PROPOSED BOARDWALK AND "I"-WALL (1&2 C3-1)
- PROPOSED WETLAND PLANTINGS; SEE NOTE 6 BELOW; PLANTING ZONE A (3 C3-4)
- PROPOSED WETLAND PLANTINGS; SEE NOTE 7 BELOW; PLANTING ZONE B (3 C3-4)
- PROPOSED OPEN CELL ARTICULATING CONCRETE BLOCK W/ WETLAND PLANTINGS; PLANTING ZONE C (1 C3-5)
- OYSTER BAGS
- SF SILT FENCE
- XX STAKED TURBIDITY BARRIER
- 6 FT. CHAIN LINK PANEL FENCING W/ 2 FT. HIGH FILTER FABRIC ATTACHED ALONG BOTTOM
- RIPARIAN RIGHTS BOUNDARY
- WATER LOT BOUNDARY
- MHWL MEAN HIGH WATER LINE
- WETLANDS LIMITS
- EDGE OF MARSH
- TOP OF BANK
- VEGETATION LINE
- DITCH
- FENCE
- EXISTING CONTOUR (1' INTERVALS)

NOTES

- SEE SHEET G1-5 FOR STRUCTURAL GENERAL NOTES.
- BOARDWALK EDGE SHALL BE ONE FOOT MINIMUM FROM WETLANDS BOUNDARY.
- SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE AS REQUIRED REPLACE ALL THAT IS REQUIRED IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL.
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- CONTRACTOR TO PROTECT EXISTING WETLAND PLANTINGS FROM DAMAGE. ANY DAMAGE TO EXISTING WETLAND PLANTINGS SHALL BE REPLACED TO MAINTAIN DENSITY.

Revisions

No.	Date	By	Description

BOARDWALK AND STABILIZATION PLAN

Amelia River Waterfront Stabilization Parking Lots C & D

Town/City: Fernandina Beach
County: Nassau State: Florida

Project No. 99000047.0095

Drawing No. **C2-3**

Date May 10, 2021

PA
PASSERO ASSOCIATES
engineering architecture
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BID SET

Stamp:

Client:

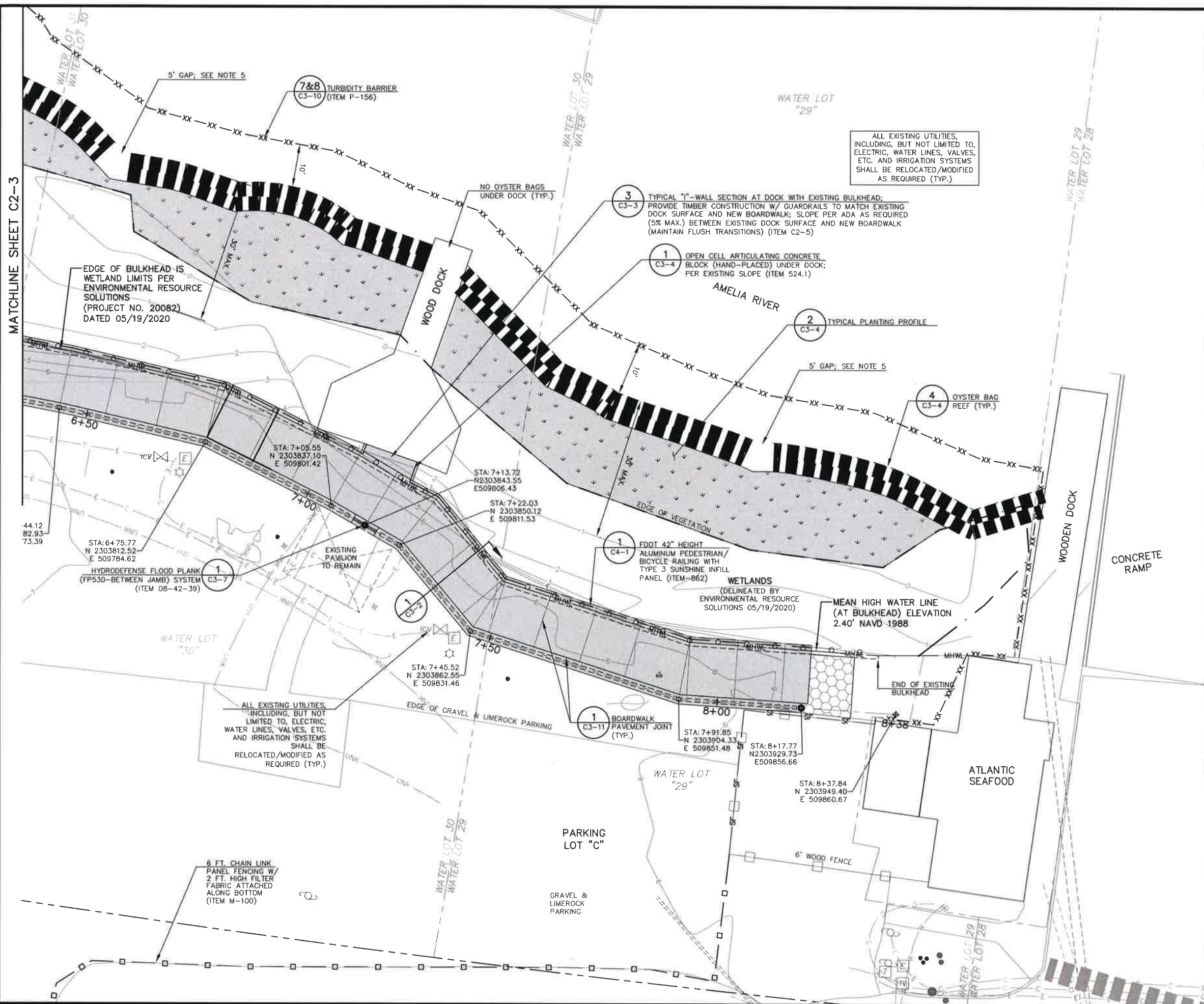
CITY OF FERNANDINA BEACH
FLORIDA

City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Casa Cola Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization: 3336
Principal-in-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredestegre

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Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C2-01_PLAN.dwg C2-4 May 07, 2021 3:23pm by: EBredestage



LEGEND

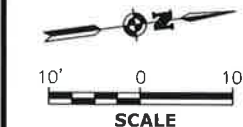
- PROPOSED BOARDWALK AND "I"-WALL (1&2 C3-1)
- PROPOSED WETLAND PLANTINGS; SEE NOTE 6 BELOW; PLANTING ZONE A (3 C3-4)
- PROPOSED WETLAND PLANTINGS; SEE NOTE 7 BELOW; PLANTING ZONE B (3 C3-4)
- PROPOSED OPEN CELL ARTICULATING CONCRETE BLOCK W/ WETLAND PLANTINGS; PLANTING ZONE C (1 C3-5)
- OYSTER BAGS
- SILT FENCE
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- 6 FT. CHAIN LINK PANEL FENCING W/ 2 FT. HIGH FILTER FABRIC ATTACHED ALONG BOTTOM
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NOTES

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- BOARDWALK EDGE SHALL BE ONE FOOT MINIMUM FROM WETLANDS BOUNDARY.
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PA
PASSERO ASSOCIATES
engineering architecture
www.passero.com

BID SET



Stamp:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Cona Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32085 Fax: (904) 757-6107
Certificate of Authorization # 3428
Principal-in-Charge Andrew M. Nolesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestage

Revisions				
No.	Date	By	Designation	Description

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BOARDWALK AND STABILIZATION PLAN

Amelia River Waterfront
Stabilization
Parking Lots C & D

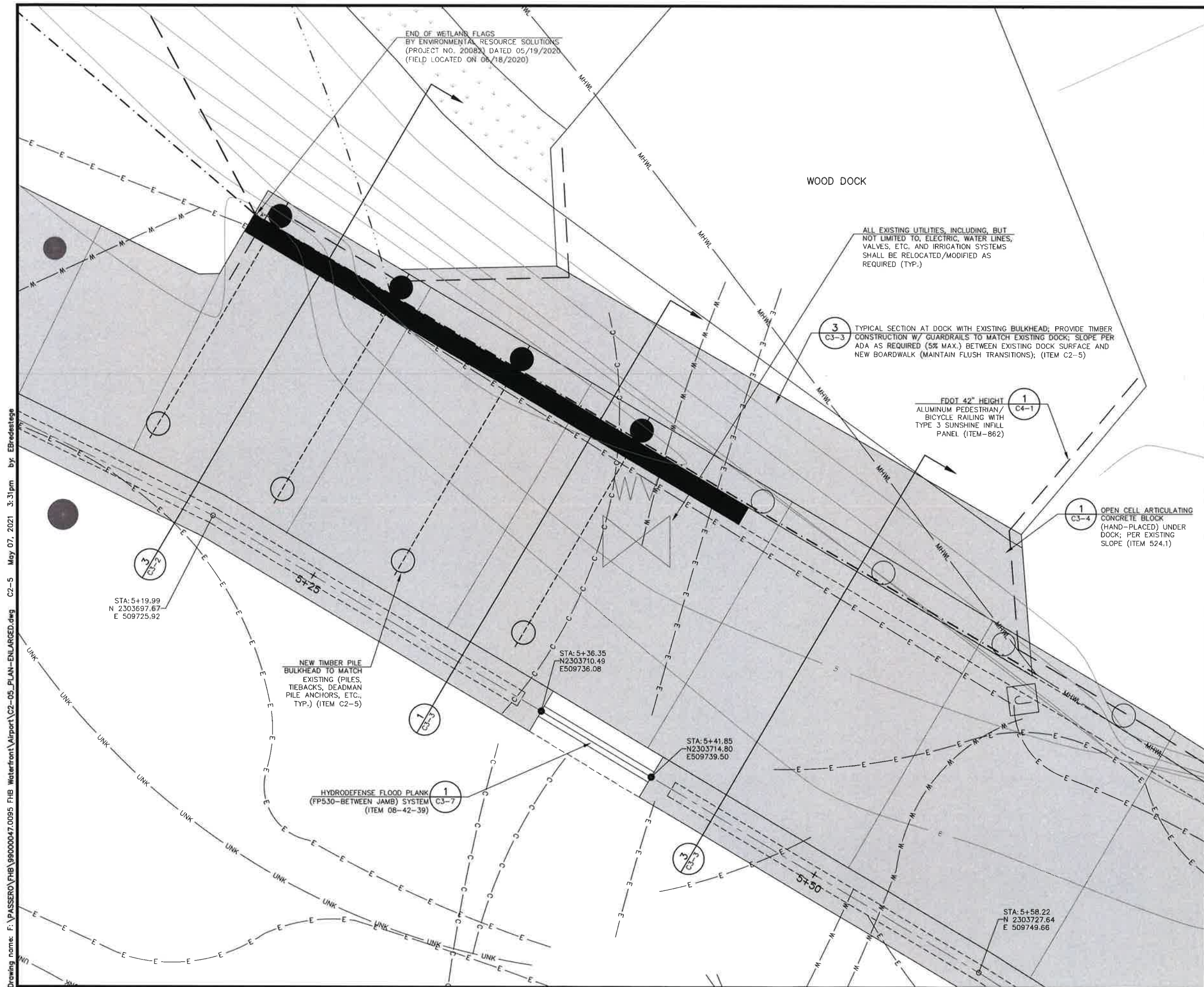
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C2-4

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C2-05_PLAN-ENLARGED.dwg C2-5 May 07, 2021 3:31pm by: EBredestestege



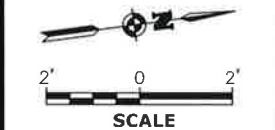
LEGEND

- | | | |
|---|--|---------------------|
|  | PROPOSED BOARDWALK
AND "1"-WALL | $\frac{1\&2}{C3-1}$ |
|  | PROPOSED WETLAND
PLANTINGS; SEE NOTE
6 BELOW;
PLANTING ZONE A | $\frac{3}{C3-4}$ |
|  | PROPOSED WETLAND
PLANTINGS; SEE NOTE
7 BELOW;
PLANTING ZONE B | $\frac{3}{C3-4}$ |
|  | PROPOSED OPEN CELL
CONCRETE BLOCK W/
WETLAND PLANTINGS;
PLANTING ZONE C | $\frac{1}{C3-5}$ |

- | | |
|---|--|
|  | OYSTER BAGS |
|  | SILT FENCE |
|  | STAKED TURBIDITY BARRIER |
|  | 6 FT. CHAIN LINK PANEL FENCING W/ 2 FT. HIGH FILTER FABRIC ATTACHED ALONG BOTTOM |
|  | RIPIARIAN RIGHTS BOUNDARY |
|  | WATER LOT BOUNDARY |
|  | MEAN HIGH WATER LINE |
|  | WETLANDS LIMITS |
|  | EDGE OF MARSH |
|  | TOP OF BANK |
|  | VEGETATION LINE |
|  | DITCH |
|  | FENCE |
|  | EXISTING CONTOUR (1' INTERVALS) |

NOTES

1. SEE SHEET G1-5 FOR STRUCTURAL GENERAL NOTES.
2. BOARDWALK EDGE SHALL BE ONE FOOT MINIMUM FROM WETLANDS BOUNDARY.
3. SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE AS REQUIRED REPLACE ALL THAT IS REQUIRED IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL.
4. SELECTIVE DEMOLITION OF EXISTING PRESSURE TREATED TIMBER DOCK AS REQUIRED TO INSTALL REMAINING TIMBER BULKHEAD PROVIDE SLOPE PER ADA AS REQUIRED FROM PROPOSED CONCRETE BOARDWALK AND EXISTING WOOD DOCK SURFACE REPLACE IN KIND TO MATCH EXISTING INCLUDING GUARDRAIL.
5. OYSTER BAG REEF: CONTRACTOR SHALL PROVIDE A 5 FOOT GAP EVERY 75 LINEAR FEET MAX. APPROXIMATE PREFERRED GAP LOCATIONS SHOWN ON PLANS.
6. PROPOSED WETLAND PLANTINGS: CONTRACTOR SHALL PROVIDE WETLAND PLANTINGS, INCLUDING ERODED BARE AREAS AS REQUIRED FOR A UNIFORMED DENSITY.
7. CONTRACTOR TO PROTECT EXISTING WETLAND PLANTINGS FROM DAMAGE. ANY DAMAGE TO EXISTING WETLAND PLANTINGS SHALL BE REPLACED TO MAINTAIN DENSITY.

**BID SET**

Stamp:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates

4730 Casa Cola Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 342E

Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredesteig

Revisions

No.	Dagur	Byr	Samdráttur

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ADMINISTRATIVE CODE 61615-27-001 AND FLORIDA STATUTES
421.018(1). THESE P.N.S. ARE COPYRIGHTED MATERIALS ©

BOARDWALK AND STABILIZATION PLAN: ENLARGED AREA

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

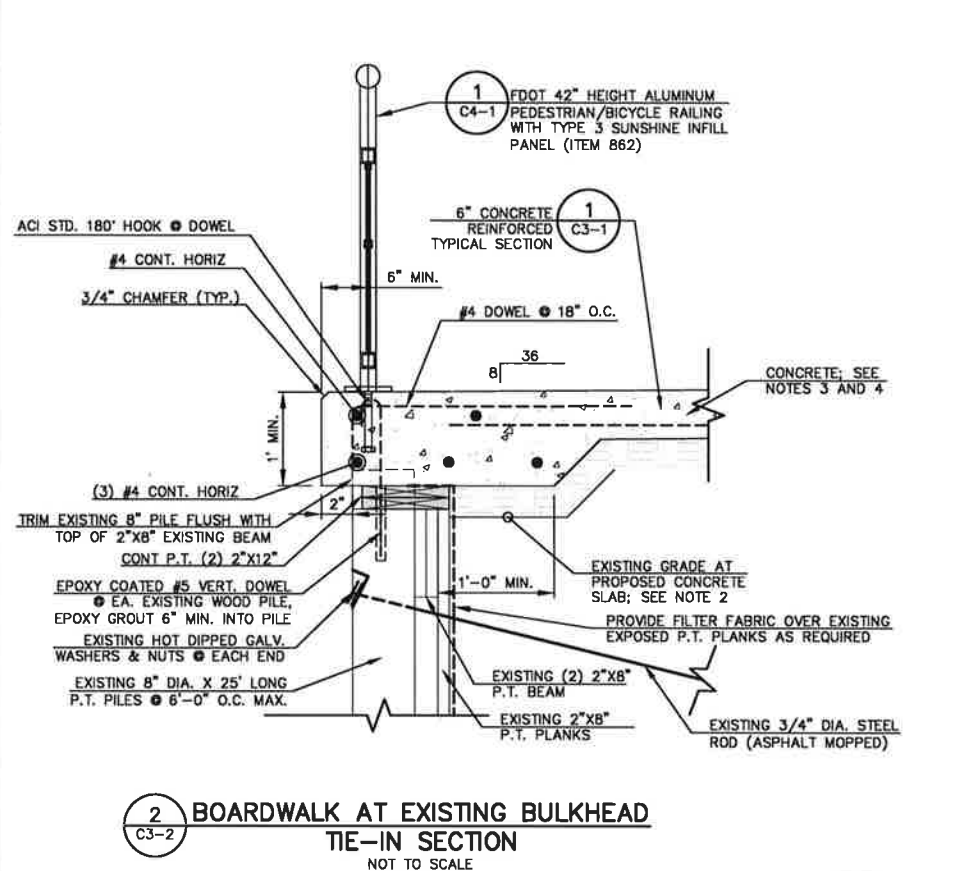
Project No. 99000047.0095

Drawing No. **C2-5**

Date
May 10, 2021

May 10, 2021

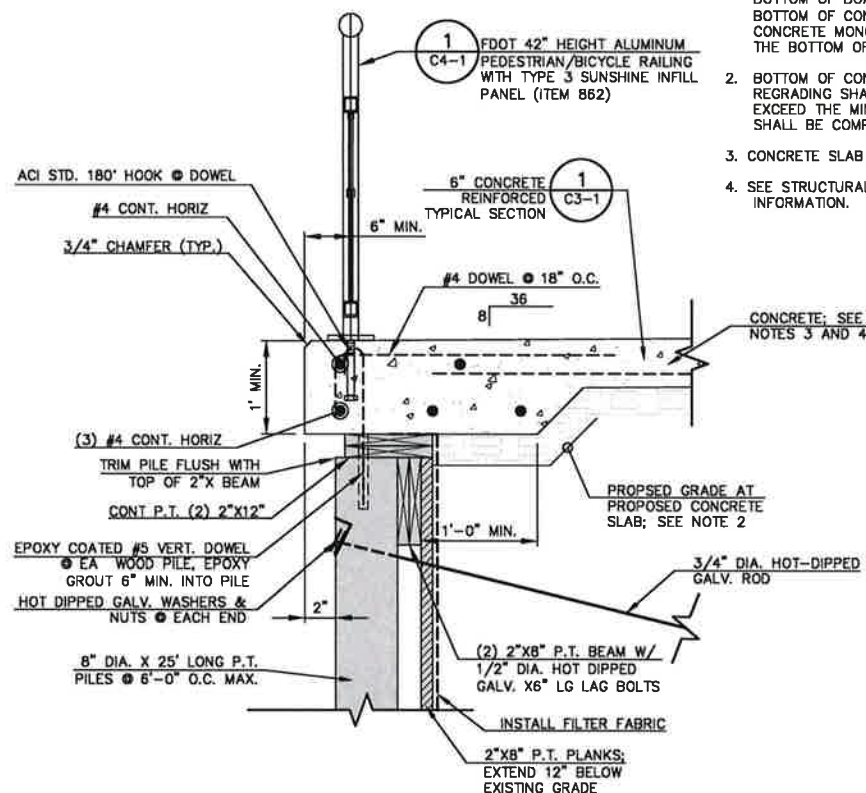
Drawing name: F:\PASSERO\FHB\99000047.D095 FHB Waterfront\Airport\C3-01_TYP-SECT.dwg C3-2_TYP-SECT May 07, 2021 3:12pm by: EBredastego



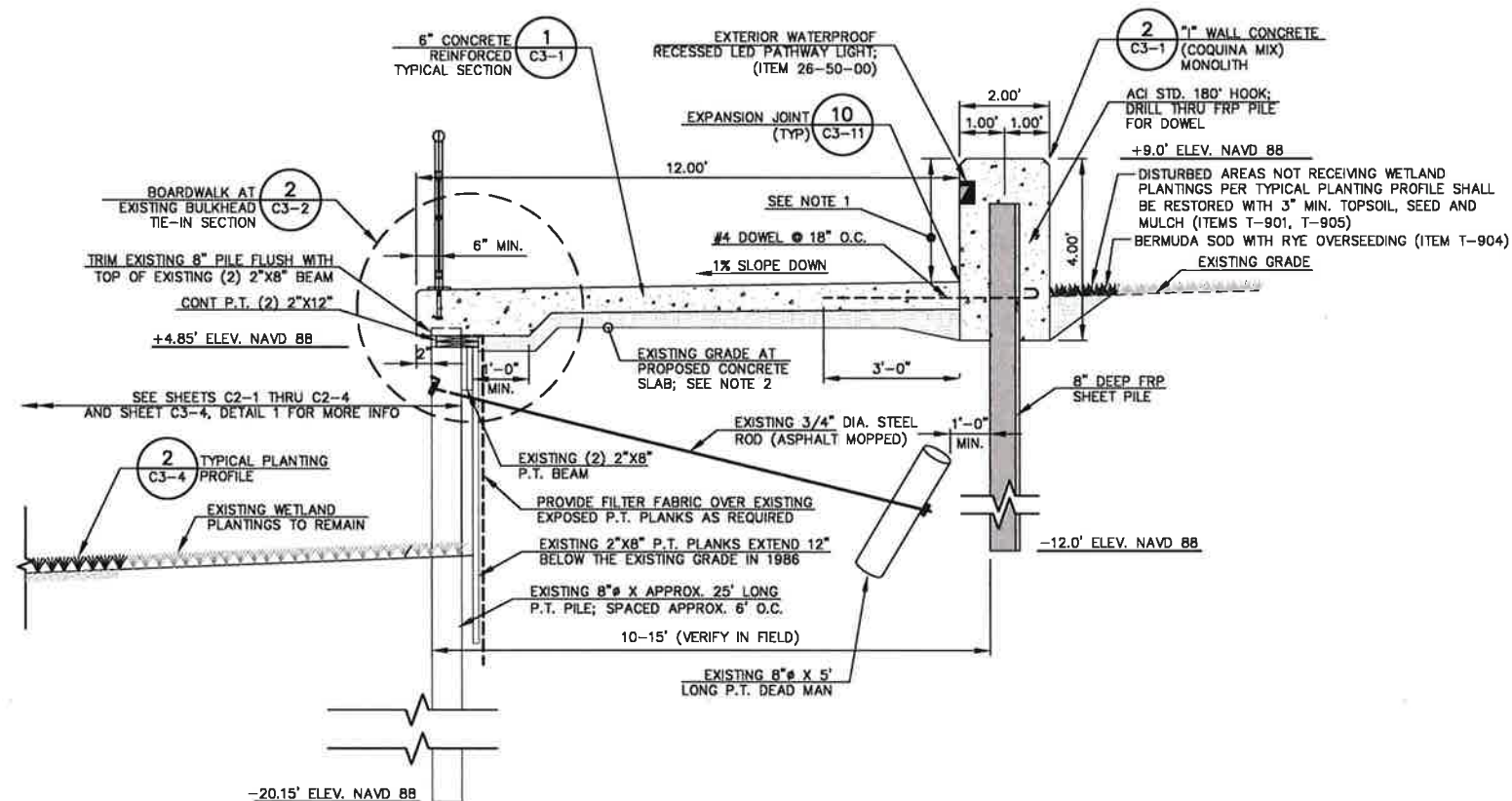
2 BOARDWALK AT EXISTING BULKHEAD
TIE-IN SECTION
NOT TO SCALE

NOTES:

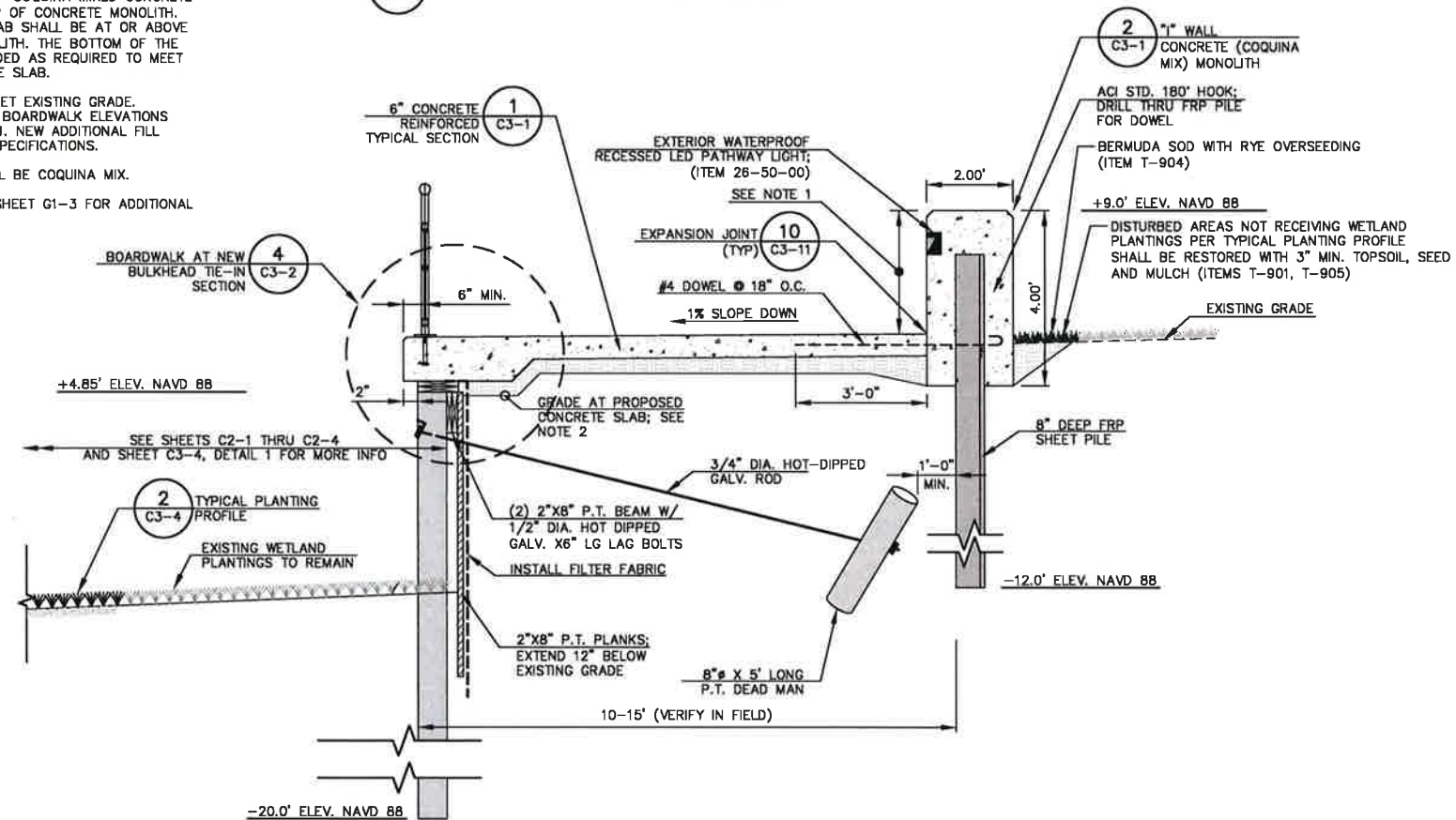
1. BOARDWALK ELEVATION VARIES. TOP OF COQUINA MIXED CONCRETE SLAB SHALL BE 1'-0" MIN. BELOW TOP OF CONCRETE MONOLITH. BOTTOM OF BOARDWALK CONCRETE SLAB SHALL BE AT OR ABOVE BOTTOM OF CONCRETE "I"-WALL MONOLITH. THE BOTTOM OF THE CONCRETE MONOLITH SHALL BE EXTENDED AS REQUIRED TO MEET THE BOTTOM OF BOARDWALK CONCRETE SLAB.
2. BOTTOM OF CONCRETE SLAB SHALL MEET EXISTING GRADE. REGRADING SHALL BE REQUIRED WHEN BOARDWALK ELEVATIONS EXCEED THE MIN. OR MAX. PER NOTE 1. NEW ADDITIONAL FILL SHALL BE COMPACTED PER PROJECT SPECIFICATIONS.
3. CONCRETE SLAB FOR BOARDWALK SHALL BE COQUINA MIX.
4. SEE STRUCTURAL GENERAL NOTES ON SHEET G1-3 FOR ADDITIONAL INFORMATION.



4 BOARDWALK AT NEW BULKHEAD
TIE-IN SECTION
NOT TO SCALE



1 TYPICAL "I"-WALL SECTION AT EXISTING BULKHEAD
NOT TO SCALE



3 TYPICAL "I"-WALL SECTION WITH NEW BULKHEAD
NOT TO SCALE

BID SET

Stamp:

Client:



City of Fernandina Beach

204 Ash St.

Fernandina Beach, Florida, 32034

Passero Associates

4730 Casa Cole Way, Suite 200 (904) 797-6106
St. Augustine, FL 32085 Fax: (904) 797-6107
Certificate of Authorization # 9418
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredastego

Revisions			
No.	Date	By	Description

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TYPICAL
SECTIONS

Amelia River Waterfront
Stabilization
Parking Lots C & D

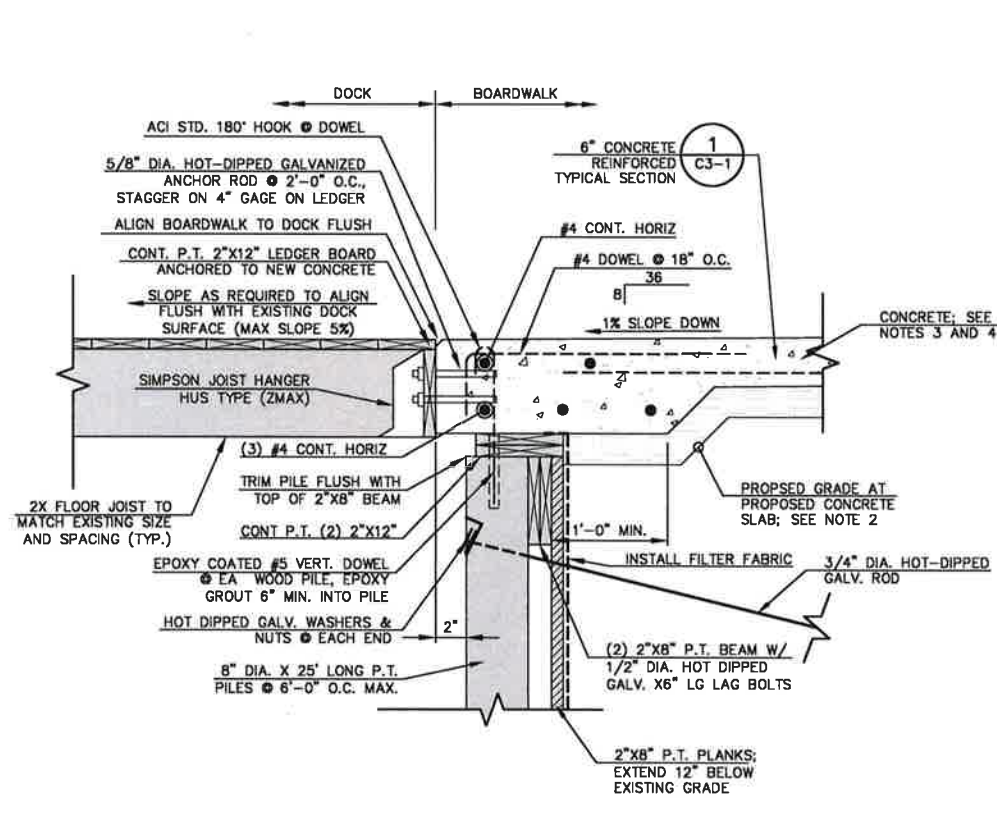
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

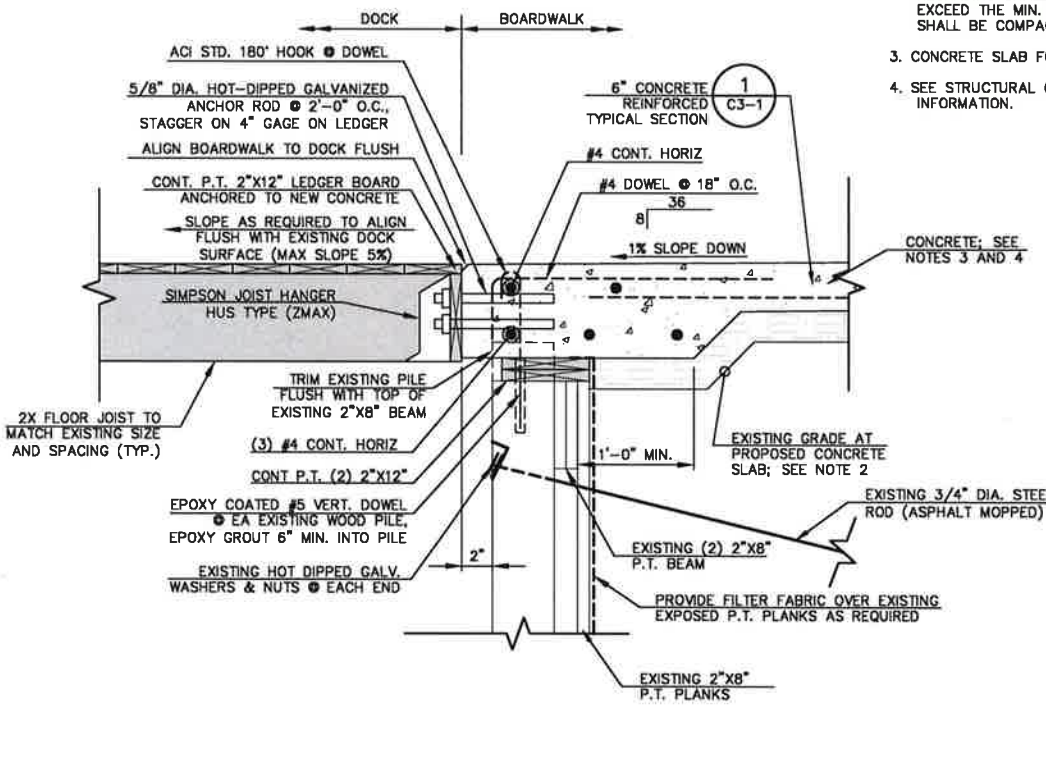
Drawing No.
C3-2

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C3-01_TYP-SECT.dwg C3-3_TYP-SECT May 07, 2021 3:12pm by: EBradesteg

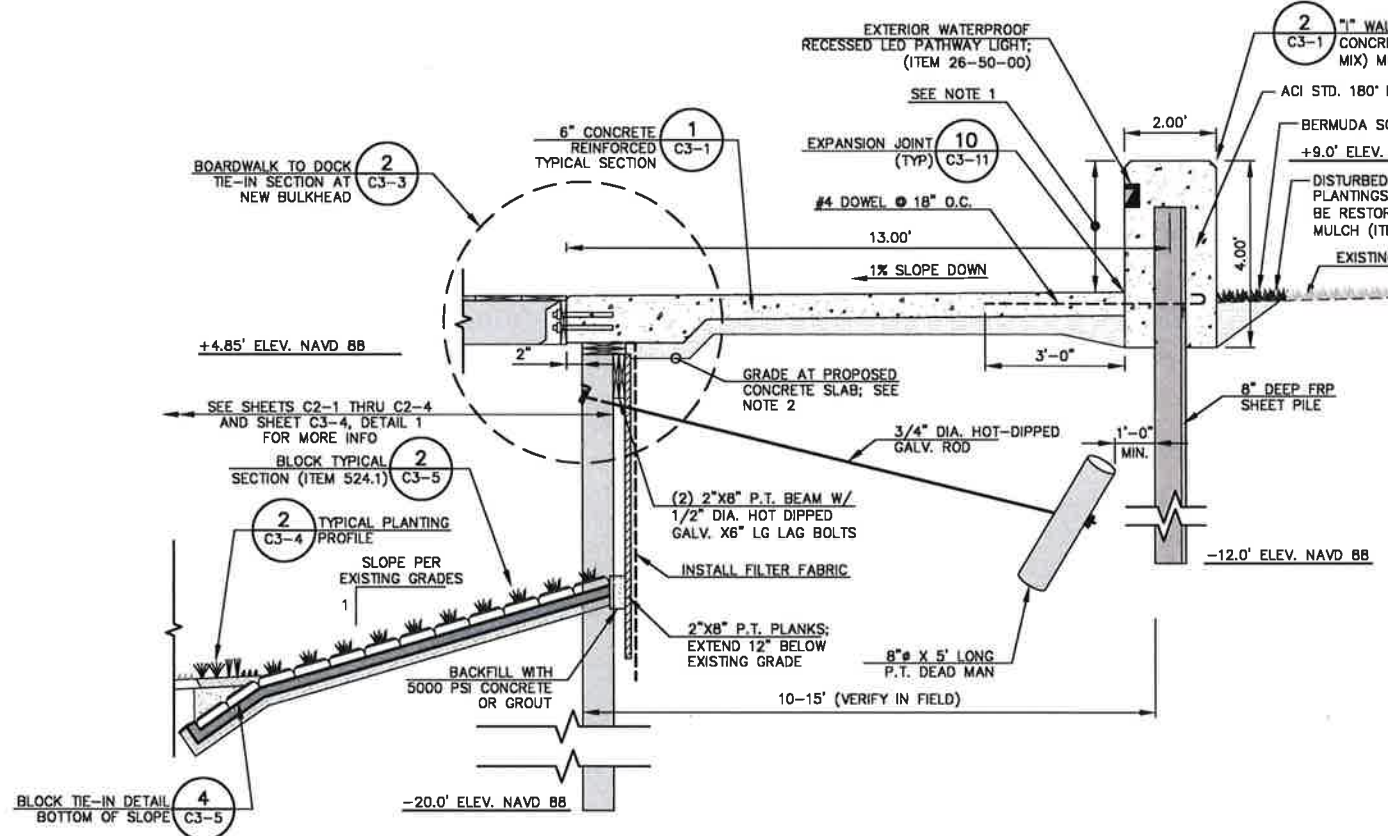


2 BOARDWALK TO DOCK TIE-IN SECTION AT NEW BULKHEAD NOT TO SCALE

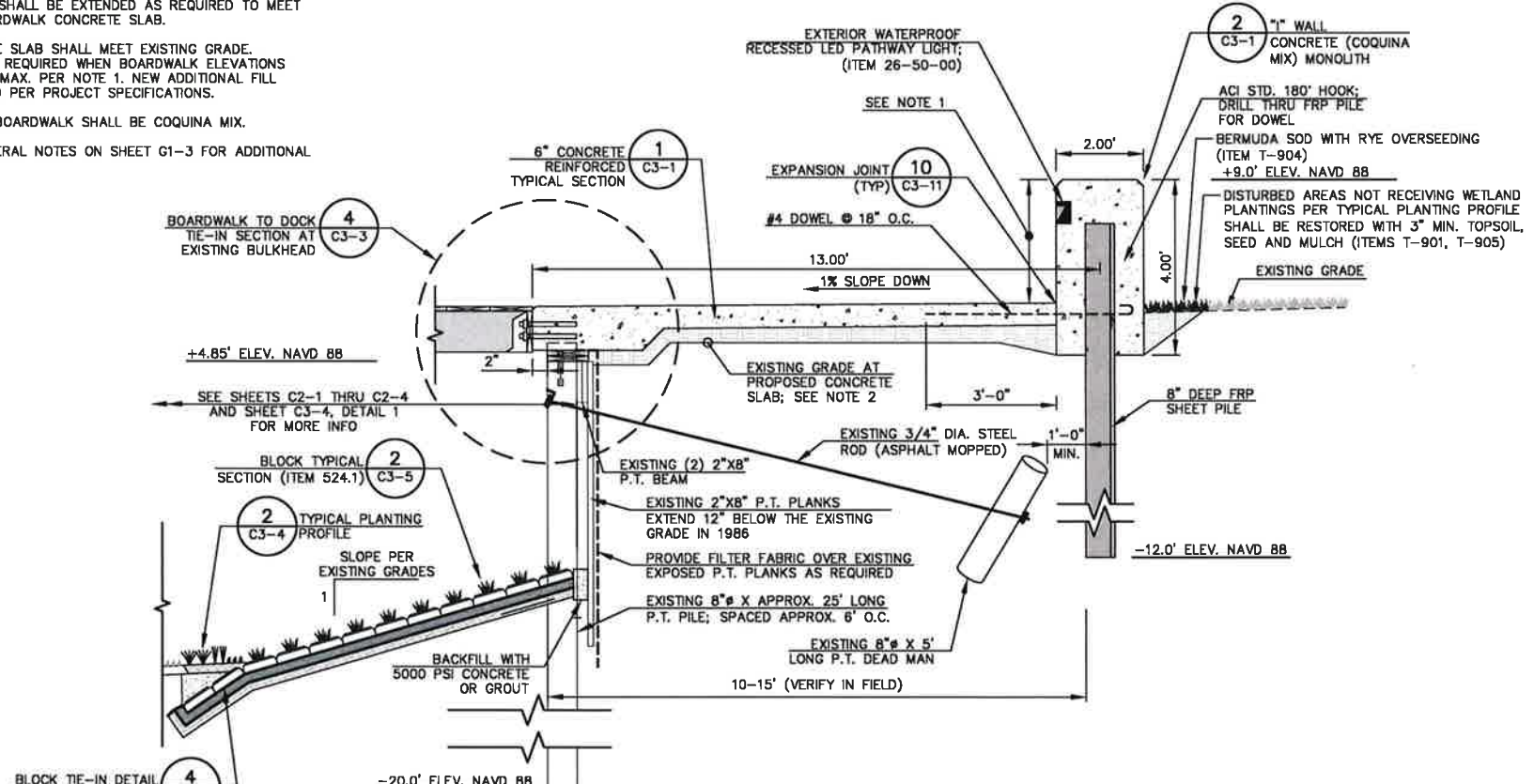


4 BOARDWALK TO DOCK TIE-IN SECTION AT EXISTING BULKHEAD NOT TO SCALE

- NOTES:
- BOARDWALK ELEVATION VARIES. TOP OF COQUINA MIXED CONCRETE SLAB SHALL BE 1'-0" MIN. BELOW TOP OF CONCRETE MONOLITH. BOTTOM OF BOARDWALK CONCRETE SLAB SHALL BE AT OR ABOVE BOTTOM OF CONCRETE "I"-WALL MONOLITH. THE BOTTOM OF THE CONCRETE MONOLITH SHALL BE EXTENDED AS REQUIRED TO MEET THE BOTTOM OF BOARDWALK CONCRETE SLAB.
 - BOTTOM OF CONCRETE SLAB SHALL MEET EXISTING GRADE. REGRADING SHALL BE REQUIRED WHEN BOARDWALK ELEVATIONS EXCEED THE MIN. OR MAX. PER NOTE 1. NEW ADDITIONAL FILL SHALL BE COMPACTED PER PROJECT SPECIFICATIONS.
 - CONCRETE SLAB FOR BOARDWALK SHALL BE COQUINA MIX.
 - SEE STRUCTURAL GENERAL NOTES ON SHEET G1-3 FOR ADDITIONAL INFORMATION.



1 TYPICAL "I"-WALL SECTION AT DOCK WITH NEW BULKHEAD NOT TO SCALE



3 TYPICAL "I"-WALL SECTION AT DOCK WITH EXISTING BULKHEAD NOT TO SCALE

PA
PASSERO ASSOCIATES
engineering architecture
www.passero.com

BID SET

Stamp:

Client:


City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4750 Case Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32085 Certificate of Authorization # 3428 Fax: (904) 757-6107
Principal-in-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bradesteg

Revisions			
No.	Date	By	Description

TYPICAL SECTIONS

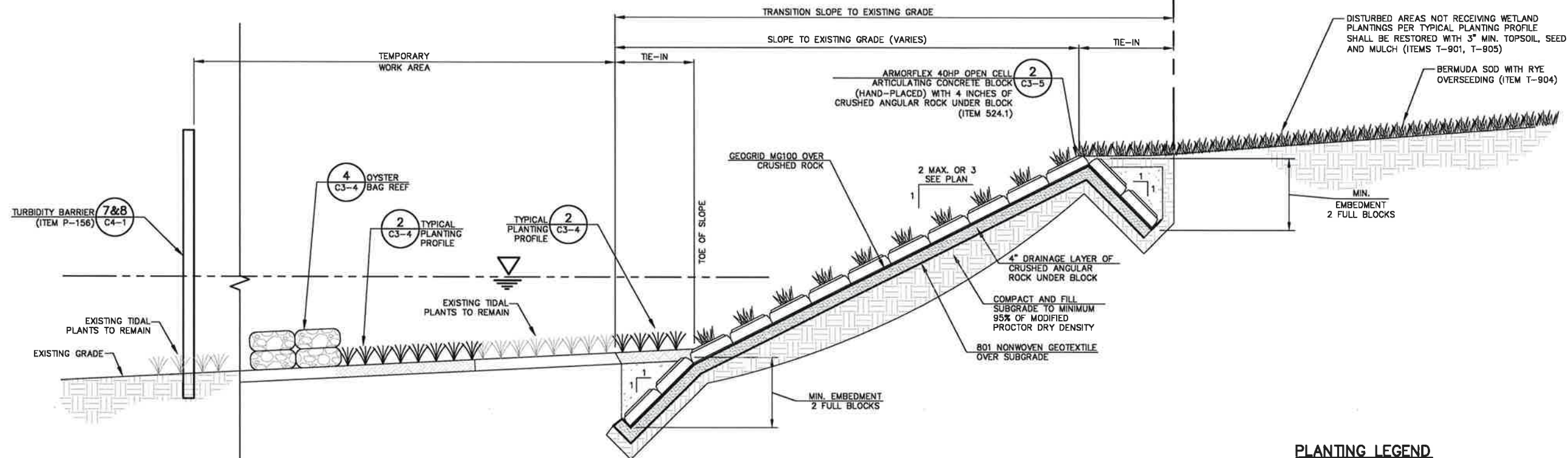
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No:
99000047.0095

Drawing No:
C3-3

Date:
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C3-01_TYP-SECT.dwg C3-4_TYP-SECT May 07, 2021 3:13pm by: EBredestage



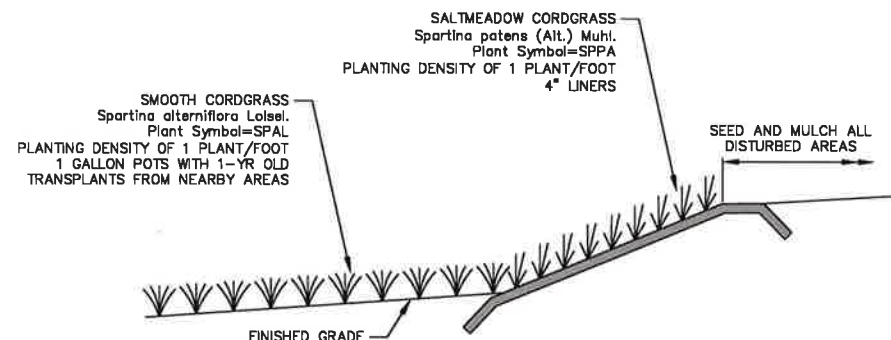
1 OPEN CELL ARTICULATING CONCRETE BLOCK (HAND-PLACED)
TYPICAL SECTION
NOT TO SCALE

PLANTING SCHEDULE (ITEM T-910)					
PLANTING ZONE	PLANT SPECIES	ELEVATION (FEET)	ZONE AREA (SF)	ZONE AREA (ACRES)	PERCENT COVER
ZONE A	<i>Spartina alterniflora</i>	0 TO 2.0	11,000	0.253	100%
ZONE B	<i>Spartina patens</i>	2.0 TO 3.0	1,200	0.028	100%
ZONE C	<i>Spartina patens</i>	3.0+	6,500	0.150	100%

NOTES:

- ALL CONSTRUCTION AREAS WITHIN THE JURISDICTIONAL WETLAND LINE SHALL RECEIVE WETLAND PLANTING PER THE ABOVE PLANTING SCHEDULE AND ITEM T-910. THIS INCLUDES ALL PERMANENT WETLAND IMPACT AREAS AND ALL PERMANENT SURFACE WATER IMPACT AREAS. SEE CROSS SECTIONS. TEMPORARY WETLAND IMPACT AREAS SHALL NOT RECEIVE SEED AND MULCH.
- ALL AREAS TO RECEIVE WETLAND PLANTING AND TEMPORARY WETLAND IMPACT AREAS SHALL HAVE NATIVE SOIL FROM WETLAND AREAS IN THE UPPER THREE INCHES OF FINAL GRADE. ALL OPENINGS IN ARTICULATING CONCRETE SHALL BE FILLED WITH TOP SOIL OR NATIVE WETLAND SOIL PRIOR TO PLANTING. UPPER THREE INCHES OF SOIL SHALL BE PAID AS ITEM T-905.
- SEE DRAWING FOR ADDITIONAL WETLAND MONITORING AND MAINTENANCE NOTES RELATING TO ITEM T-910.
- PROVIDE 4" LINERS FOR PLANTINGS IN OPEN CELL ARTICULATED CONCRETE BLOCK AND ONE GALLON POTS IN REMAINING AREAS.

3 WETLAND PLANTING PLAN
NOT TO SCALE

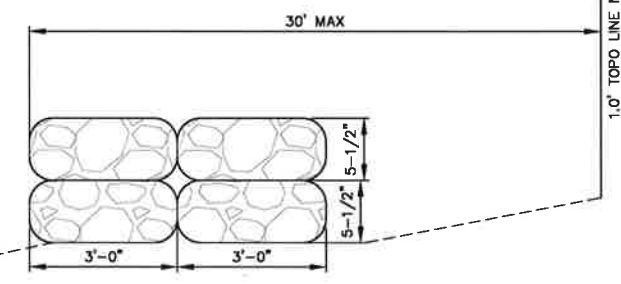
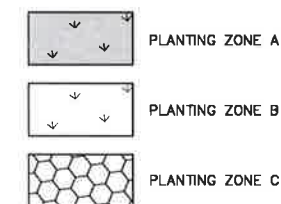


2 (ITEM T-910)
TYPICAL PLANTING PROFILE
NOT TO SCALE

NOTES:

- WETLANDS PLANTINGS SHALL BE PAID UNDER ITEM T-910.
- EROSION CONTROL MEASURES SHALL BE PAID UNDER ITEM P-156.

PLANTING LEGEND



4 OYSTER BAG REEF DETAIL
NOT TO SCALE

NOTES:

- OYSTER BAGS SHALL MEET REQUIREMENTS PER 2017 NATIONWIDE PERMIT #54 LIVING SHORELINES.
- OYSTER BAGS SHALL BE PLACED IN ROWS WITH A MAXIMUM LENGTH OF 75 FEET. A 5 FOOT GAP SHALL BE PROVIDED EVERY 75'.
- OYSTER REEF SHALL CONSIST OF TWO ROWS OF OYSTER SHELL BAGS STACKED TWO HIGH (AS SHOWN).
- PROVIDE CLEAN OYSTER SHELLS PLACED IN HEAVY DUTY PLASTIC MESH BAGS APPROXIMATELY 4-5 GALLONS OF OYSTER SHELLS PER 3'-0"X1'-6"X5-1/2" BAG SIZE. MANUFACTURER: BASIS OF DESIGN FOR BAGS SHALL BE NALTEX EXTRUDED DIAMOND NETTING BY SWM ENGINEERED FOR TOMORROW.
- SECURE OYSTER SHELL BAGS IN PLACE USING HEAVY DUTY PLASTIC CABLE TIES AND BAMBOO STAKES.

NOTE:

- COSTS ASSOCIATED WITH ITEMS ON THIS DRAWING SHALL BE INCLUDED IN CORRESPONDING ITEMS T-910, T-912, AND T-914.

BID SET

Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Case Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certification of Authorization # 3438
Principal-In-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestage

Revisions			
No.	Date	By	Description

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TYPICAL SECTIONS

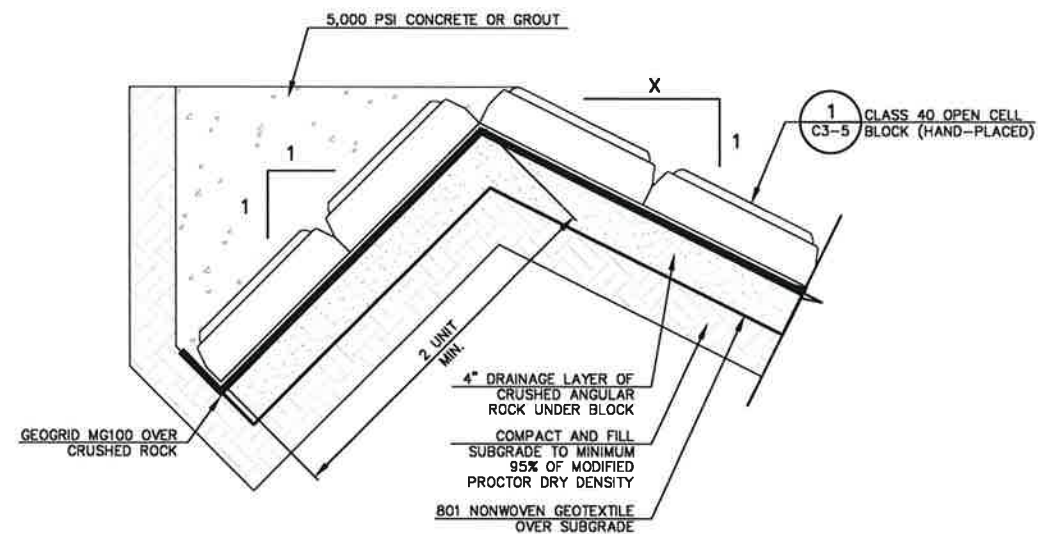
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

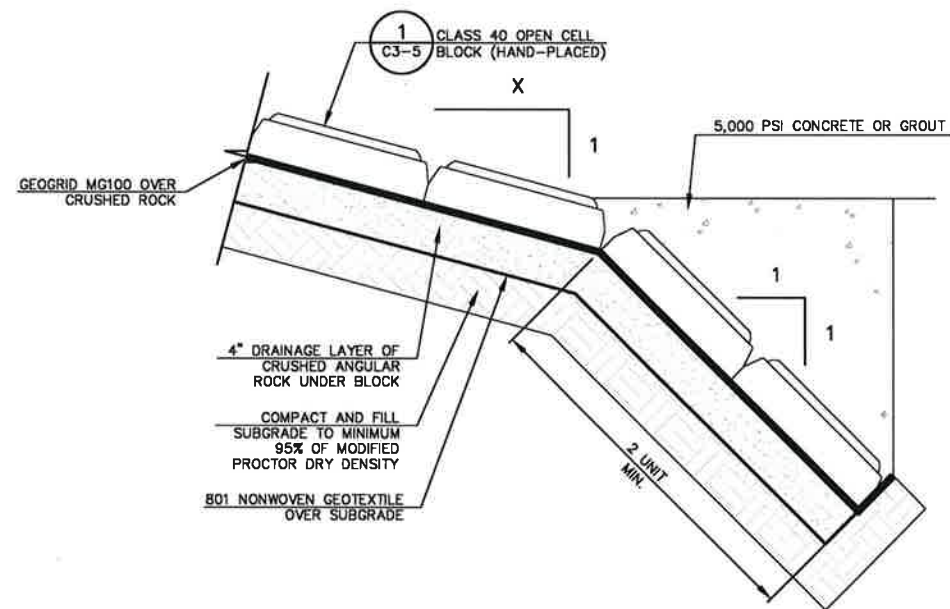
Drawing No.
C3-4

Date
May 10, 2021

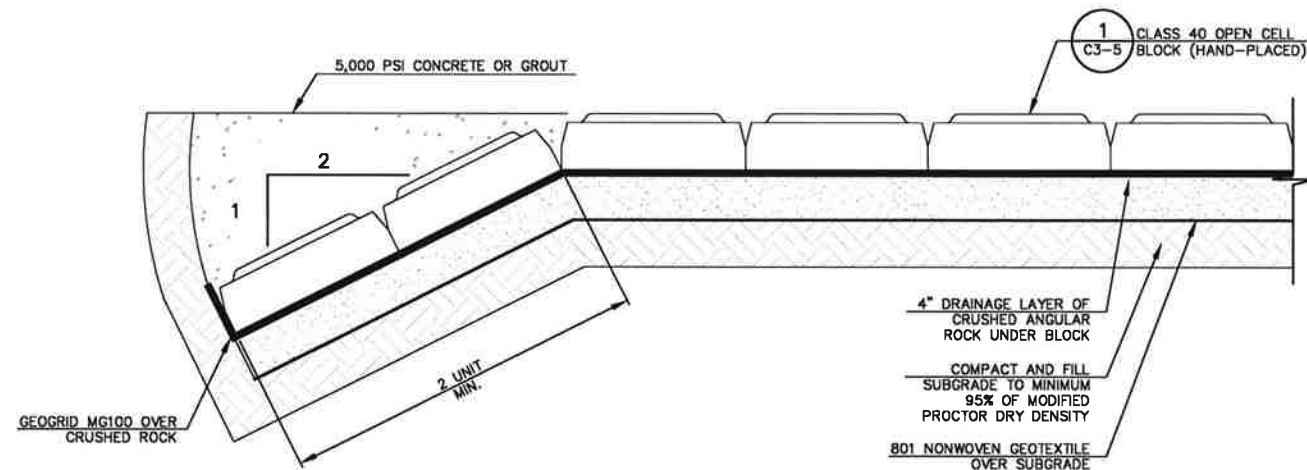
Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C3-01_TYP-SECT.dwg C3-5_TYP-SECT May 07, 2021 3:13pm by: EBredestege



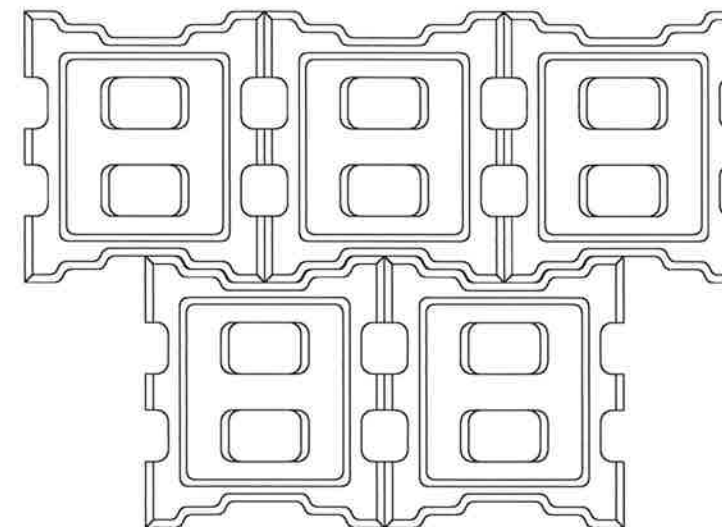
3 BLOCK TIE-IN DETAIL
C3-5 NOT TO SCALE



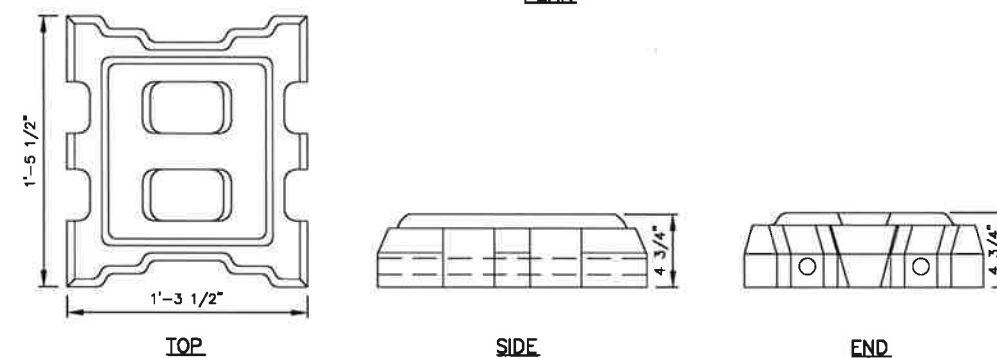
4 BLOCK TIE-IN DETAIL
C3-5 BOTTOM OF SLOPE NOT TO SCALE



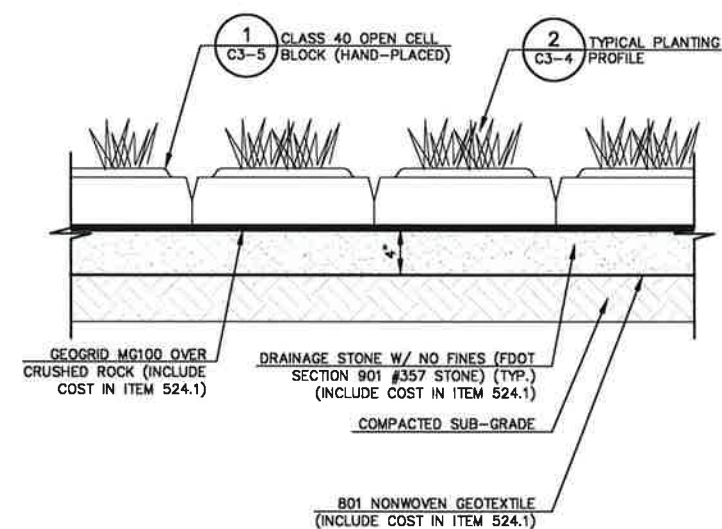
5 BLOCK TIE-IN DETAIL
C3-5 FLAT GRADE NOT TO SCALE



PLAN



1 ARMORFLEX CLASS 40 OPEN CELL BLOCK
C3-5 (HAND PLACED)
NOT TO SCALE
(INCLUDE COST IN ITEM 524.1)



2 BLOCK TYPICAL SECTION
C3-5 NOT TO SCALE

NOTE: DETAILS ON
THIS SHEET PERTAINS
TO ITEM 524.1.

BID SET

Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Cape Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32085 Fax: (904) 757-6107
Certificate of Authorization # 3428
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestege

Revisions			
No.	Date	By	Description

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**BLOCK
DETAILS**

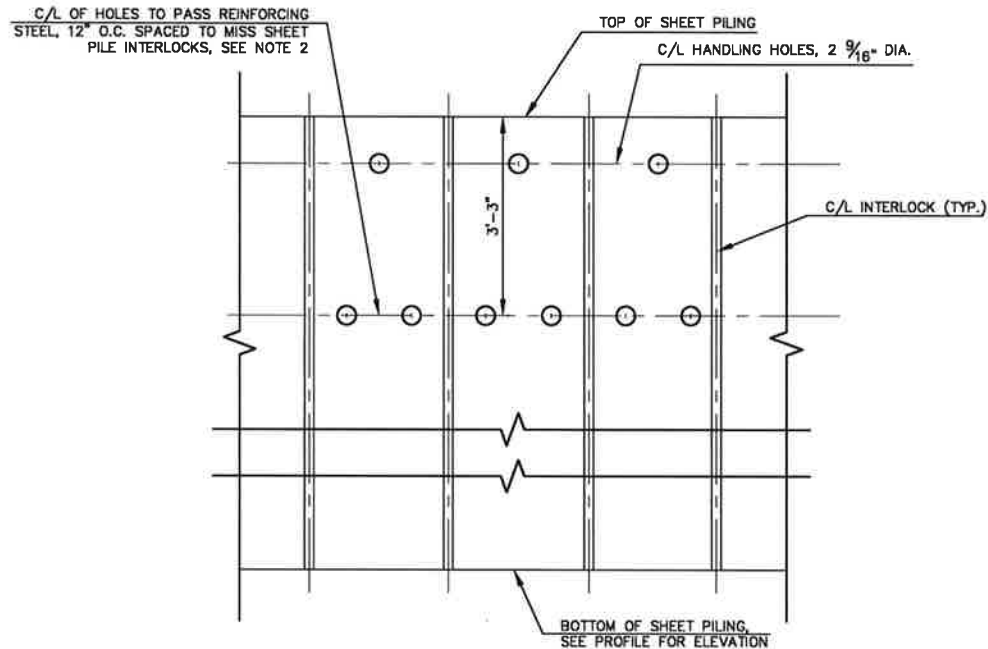
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C3-5

Date
May 10, 2021

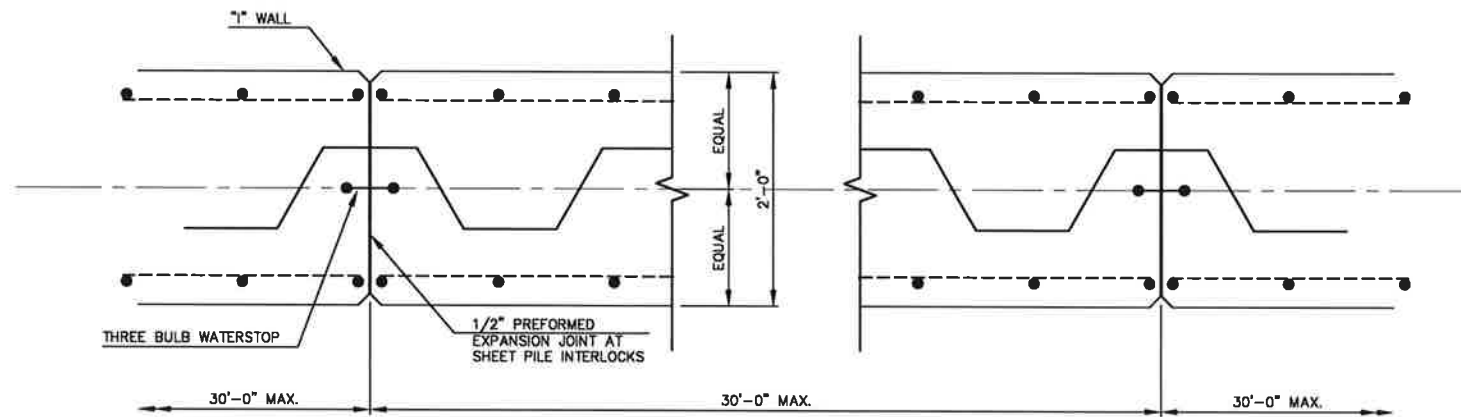
Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C3-01_TYP-SECT.dwg C3-6_TYP-SECT May 07, 2021 3:14pm by: EBrdestege



ELEVATION

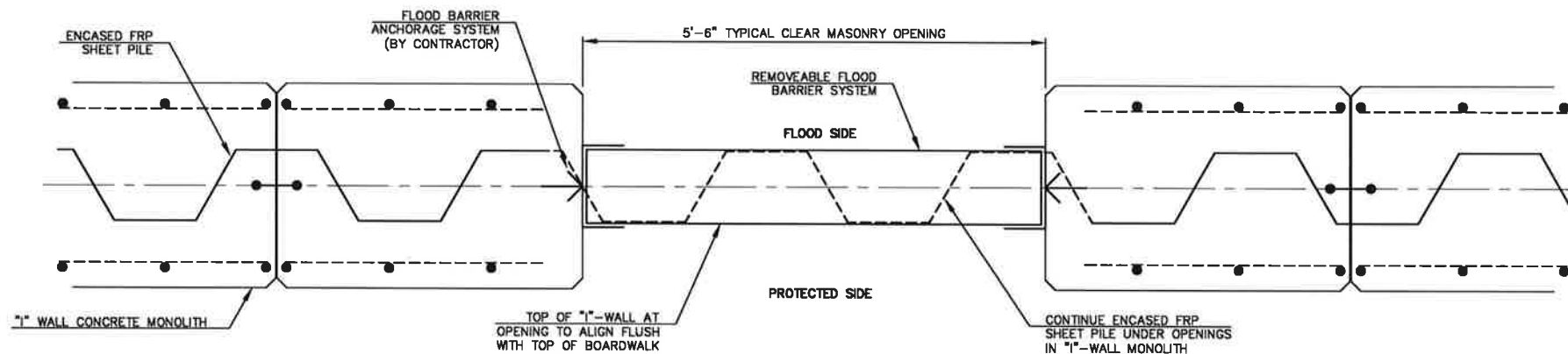
2 HOLES IN SHEET PILING DETAIL
C3-6 NOT TO SCALE

- NOTES:
1. A MINIMUM OF 6 INCHES OF CONCRETE COVER SHALL BE PROVIDED OVER SHEET PILING AT ALL POINTS.
 2. HOLES CUT INTO STEEL PILING FOR PASSING REINFORCING BARS SHALL NOT EXCEED 2" DIA. WHERE HOLES FALL WITHIN THE WEB OF THE STEEL SHEET PILE, THE HOLE SHALL BE SLOTTED 4" HORIZONTALLY TO ACCOMMODATE PASSING THE REINFORCING BARS. REINFORCING BARS SHALL BE MOVED TO MISS SHEET PILE INTERLOCKS.



1 TYPICAL "1" WALL MONOLITH SHEET PILE INTERLOCKS
C3-6 NOT TO SCALE

- NOTES:
1. MONOLITH MAX JOINT SPACING SHALL BE 30'-0".
 2. MONOLITH SECTIONS GREATER THAN 30 FEET SHALL HAVE EQUAL JOINT SPACING.



3 REMOVEABLE FLOOD BARRIER DETAIL
C3-6 NOT TO SCALE

NOTE: DETAILS ON THIS SHEET PERTAINS TO ITEM C3-6.

BID SET

Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4130 Cass Cole Way, Suite 200 St. Augustine, FL 32085
Principal-in-Charge: Andrew R. Hollesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Brdestege

Revisions			
No.	Date	By	Description

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"1"-WALL DETAILS

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

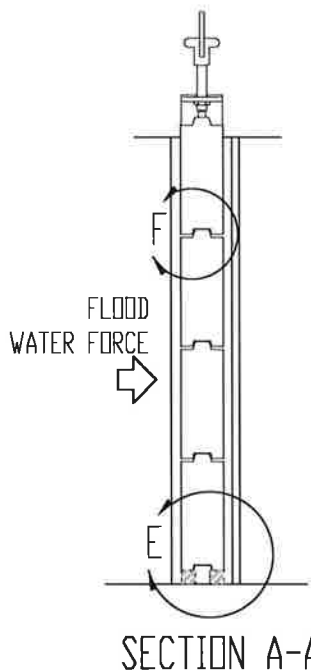
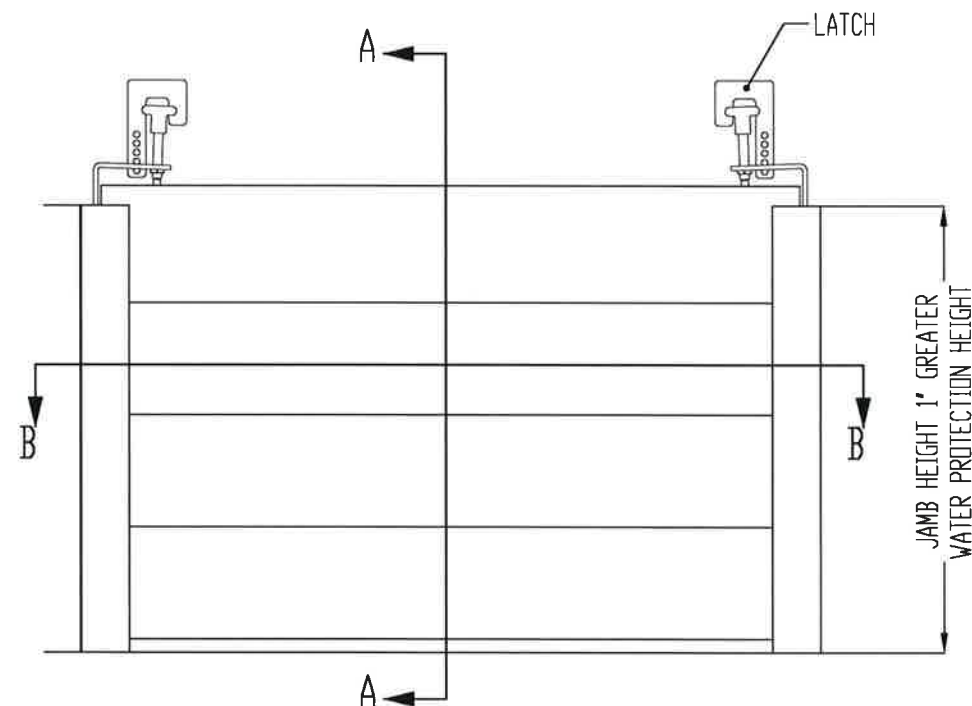
Drawing No.
C3-6

Date
May 10, 2021

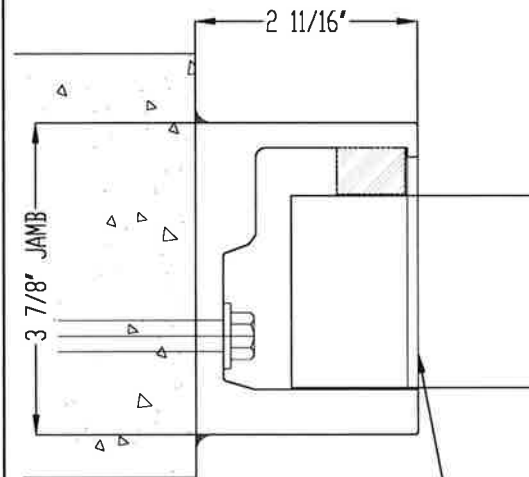
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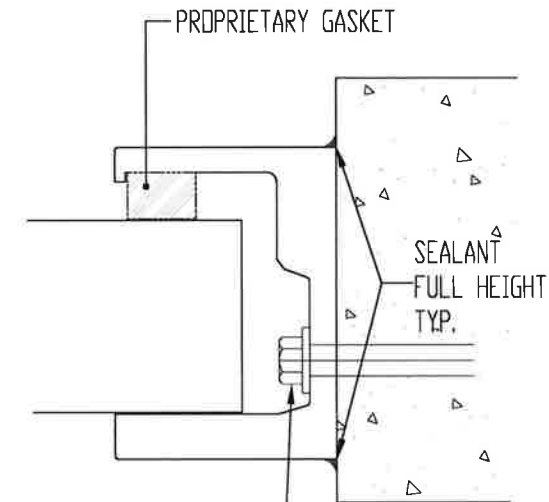
SECTION B-B



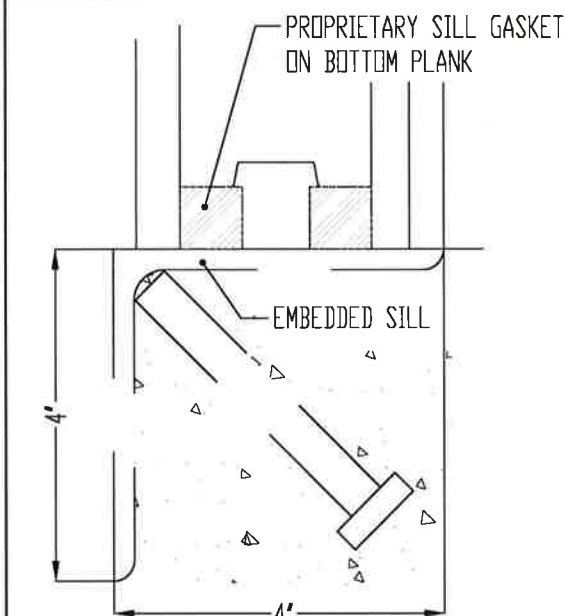
SECTION A-A



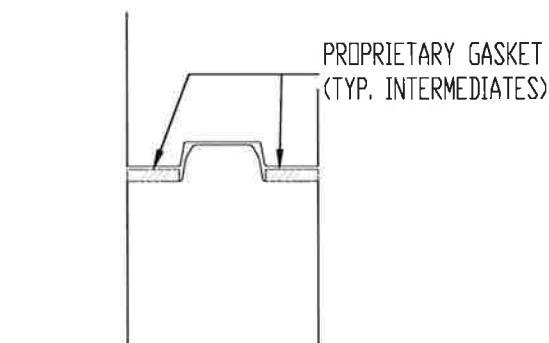
DETAIL C
JAMB DETAIL ①②③



DETAIL D
JAMB DETAIL ①②③



DETAIL E
SILL DETAIL ④



DETAIL F
INTERMEDIATE DETAIL

FP-530 FLOOD PLANK SYSTEM - BETWEEN JAMB MOUNT

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- ① LOCATION AND QUANTITY OF ANCHORS TBD BASED ON LOADING
- ② DESIGN SHOWN REQUIRES STRUCTURE TO BE A MINIMUM OF 8" GROUT FILLED CMU OR 3000 PSI CIP; CONTACT PS DOORS FOR DEVIATIONS
- ③ FLOOD LOAD ON PLANK SYSTEM IS TRANSFERRED TO BUILDING STRUCTURE
- ④ STANDARD SILL TO BE EMBEDDED ANGLE; CONTACT PS DOORS FOR ADDITIONAL OPTIONS

MODEL: FP-530

DATE: 12/28/2017

REFERENCE DRAWING
NOT FOR CONSTRUCTION

SCALE: NTS

SHEET #: 1 OF 1

DWG BY: PSDOORS

REV: E

1150 S 48th ST
GRAND FORKS, ND 58201
PH. 701-746-4519
psfloodbarriers.com

MANUFACTURER: BASIS OF DESIGN FOR FLOOD PLANK SYSTEM SHALL BE FP-530 BY PS INDUSTRIES INCORPORATED

NOTE: DETAILS ON THIS SHEET
PERTAINS TO ITEM 08-42-39

BID SET

Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4130 Case Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 3435
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestege

Revisions			
No.	Date	By	Description

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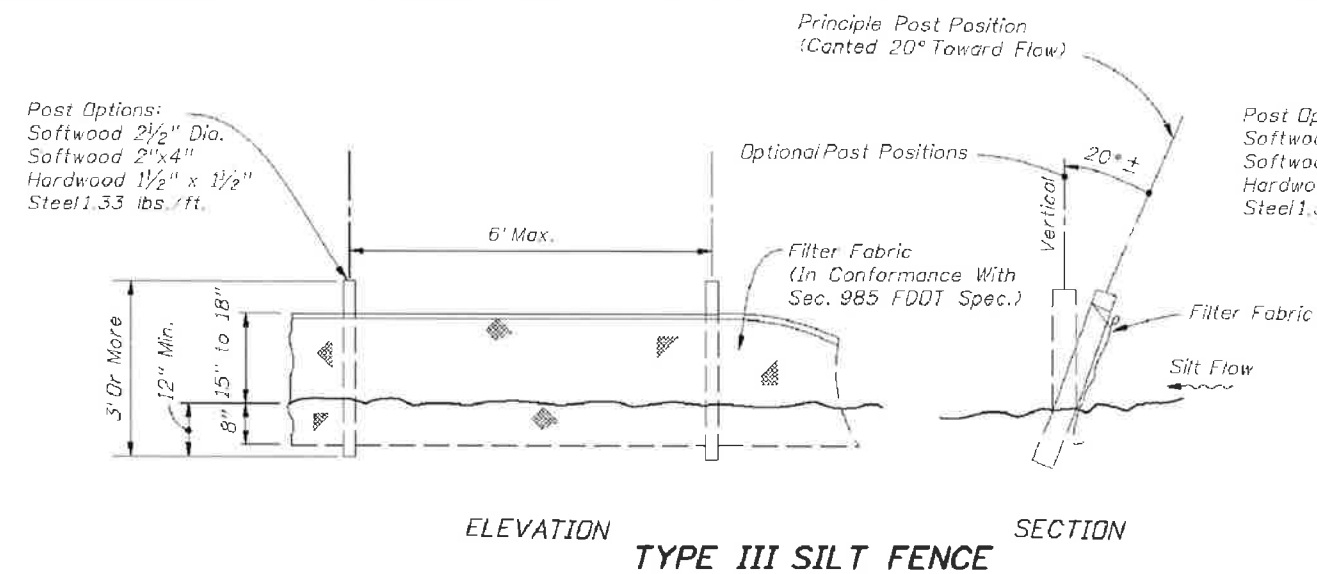
FP-530 FLOOD PLANK SYSTEM BETWEEN JAMB MOUNT DETAILS

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

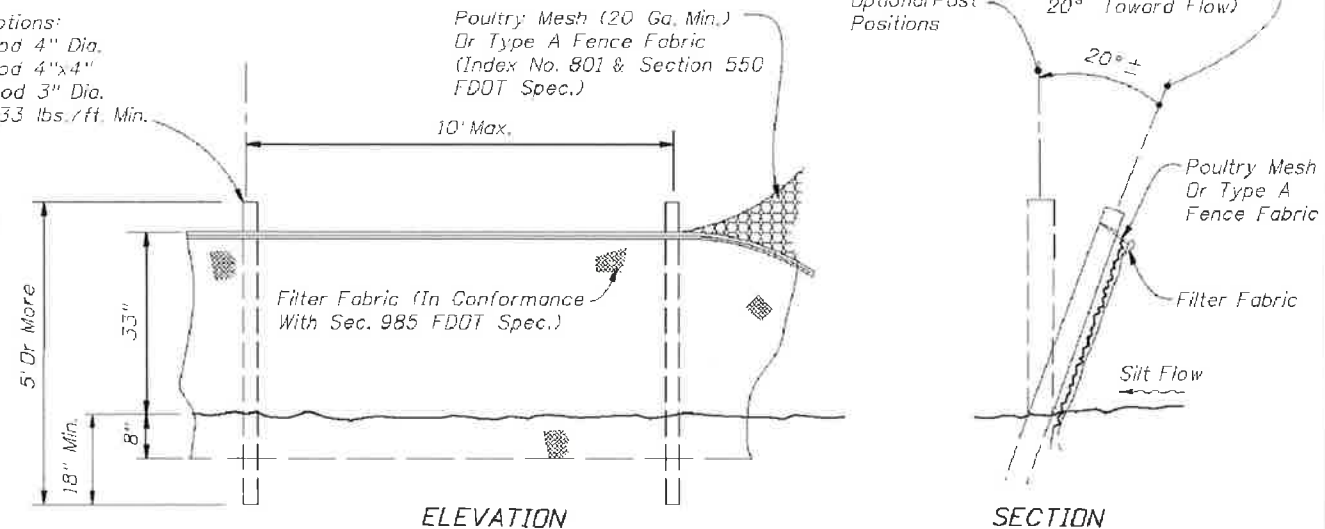
Project No.
99000047.0095

Drawing No.
C3-7
Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C3-08_FDOT-EROS-DET.dwg C3-8-FDOT-DET May 04, 2021 12:05am by: EBrdesteja



Post Options:
Softwood 4" Dia.
Softwood 4"x4"
Hardwood 3" Dia.
Steel 1.33 lbs./ft. Min.



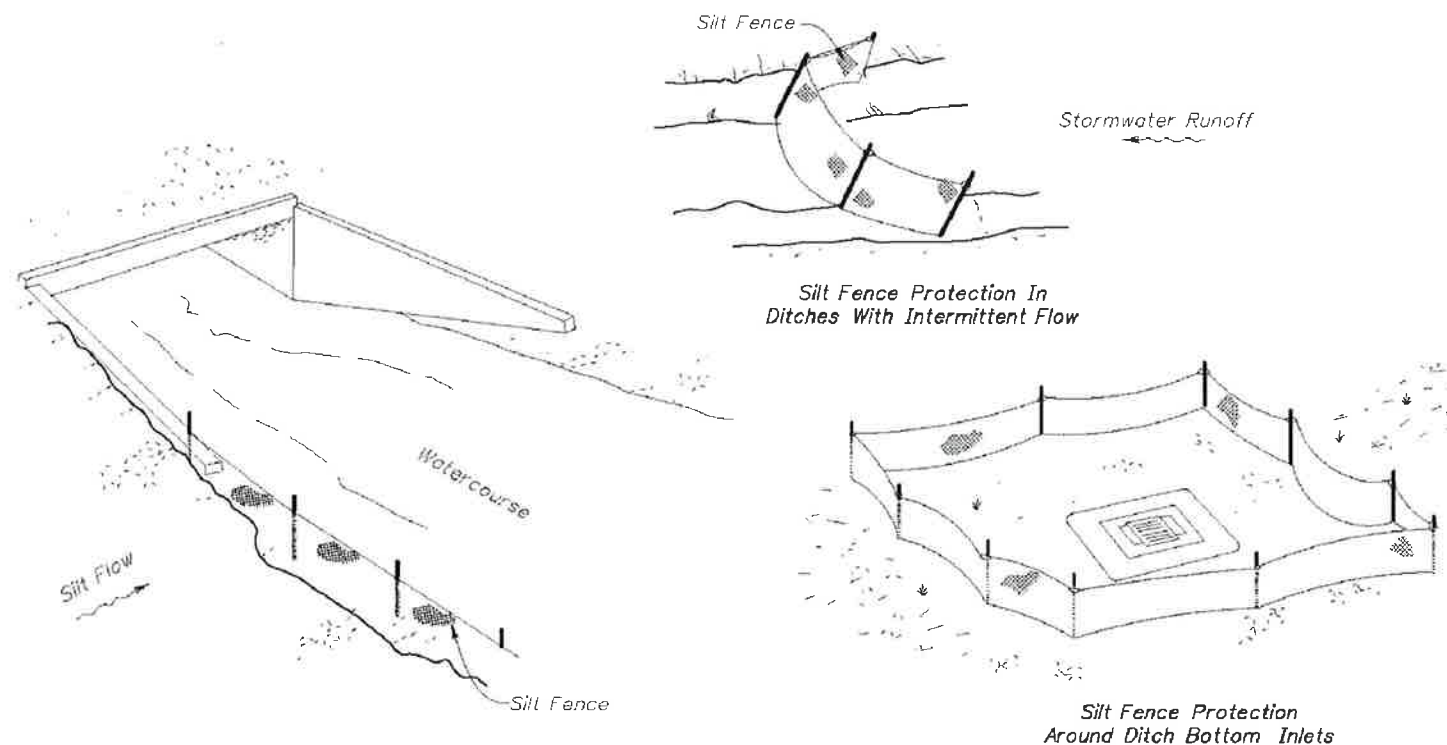
Optional Post
Positions

Principle Post
Position (Canted
20° Toward Flow)

Poultry Mesh
Or Type A
Fence Fabric

Filter Fabric

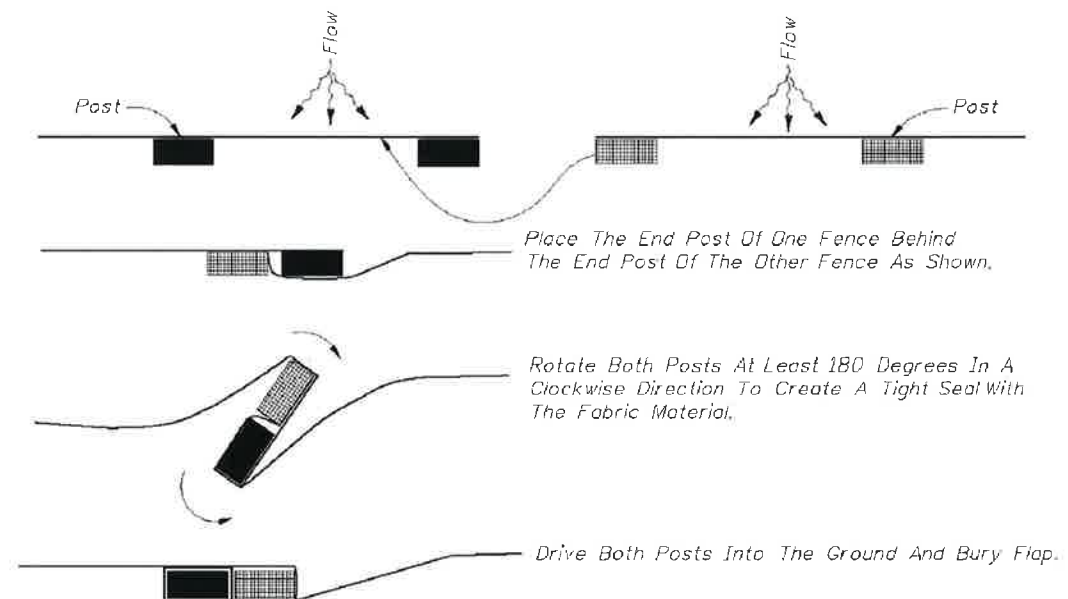
Silt Flow



SILT FENCE APPLICATIONS

NOTES FOR SILT FENCES

1. Type III Silt Fence to be used at most locations. Where used in ditches, the spacing for Type III Silt fence shall be in accordance with Chart 1, Sheet 1.
2. Type IV Silt Fence to be used where large sediment loads are anticipated. Suggested use is where fill slope is 1:2 or steeper and length of slope exceeds 25 feet. Avoid use where the detained water may back into travel lanes or off the right of way.
3. Do not construct silt fences across permanent flowing watercourses. Silt fences are to be at upland locations and turbidity barriers used at permanent bodies of water.
4. Where used as slope protection, Silt Fence is to be constructed on 0% longitudinal grade to avoid channelizing runoff along the length of the fence.
5. Silt Fence to be paid for under the contract unit price for Staked Silt Fence, (LF).



PLAN VIEW

JOINING TWO SILT FENCES



2010 FDOT Design Standards

TEMPORARY EROSION AND SEDIMENT CONTROL

Last
Revision
07/01/05

Sheet No.
3 of 3

Index No.
102

PA
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City of Fernandina Beach

204 Ash St.

Fernandina Beach, Florida, 32034

Passero Associates

4730 Cass Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32085 Fax: (904) 757-6107
Certificate of Authorization # 3428
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredesteja

Revisions			
No.	Date	By	Description

FDOT EROSION AND SEDIMENT CONTROL DETAILS

Amelia River Waterfront
Stabilization
Parking Lots C & D

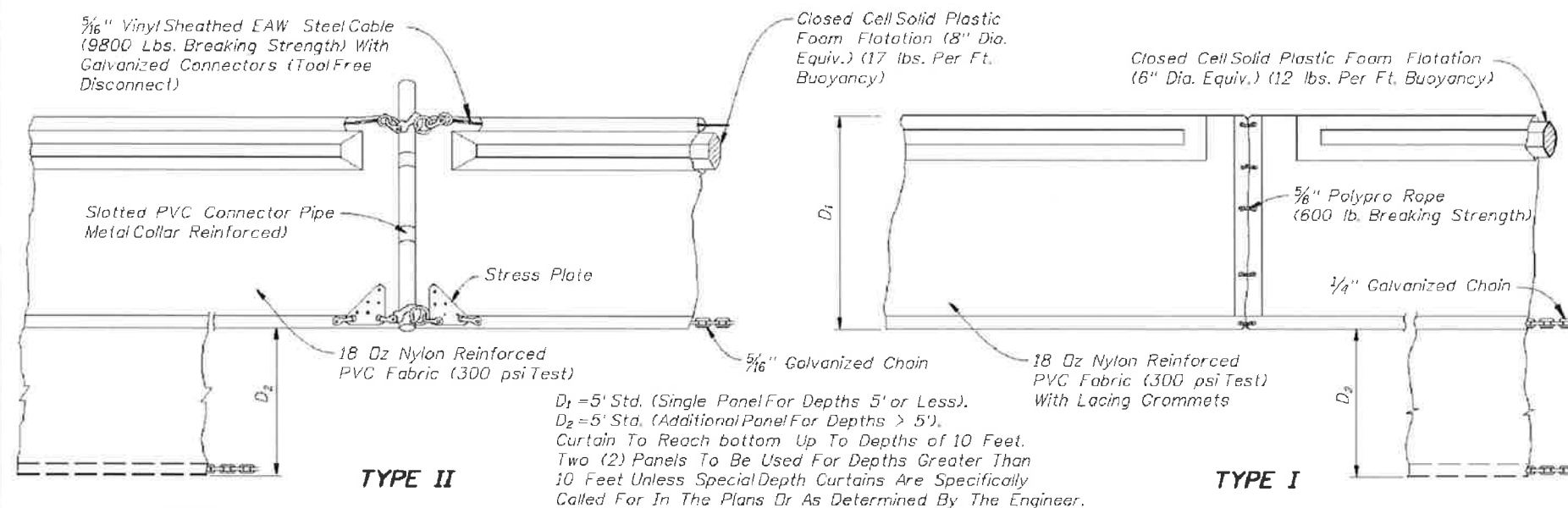
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C3-8

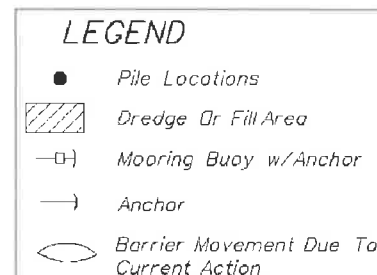
Date
April 26, 2021

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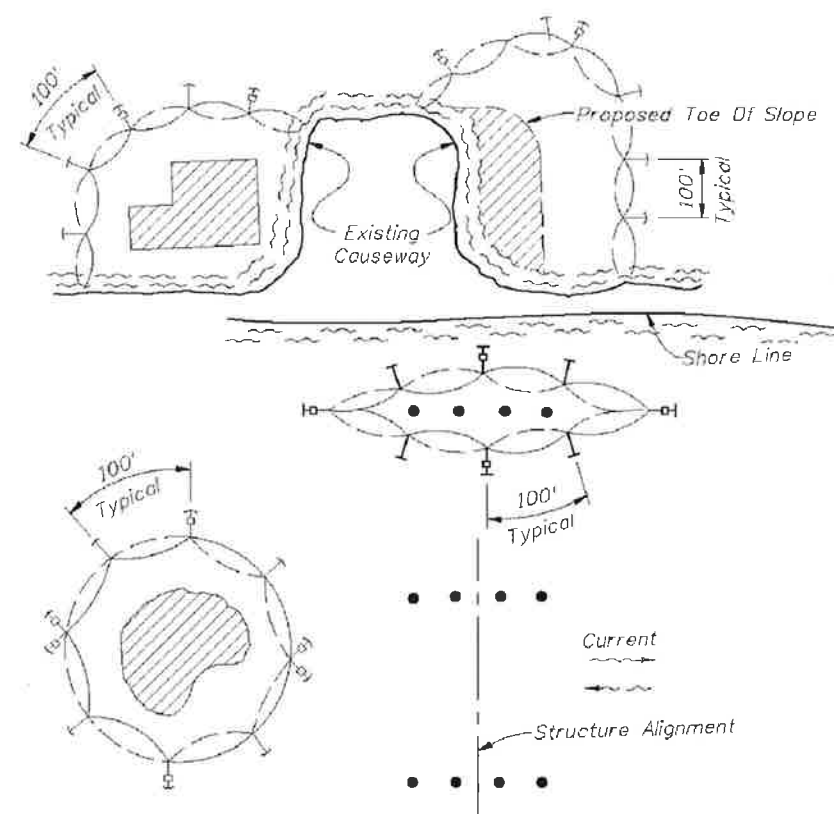
NOTICE:
COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.

FLOATING TURBIDITY BARRIERS

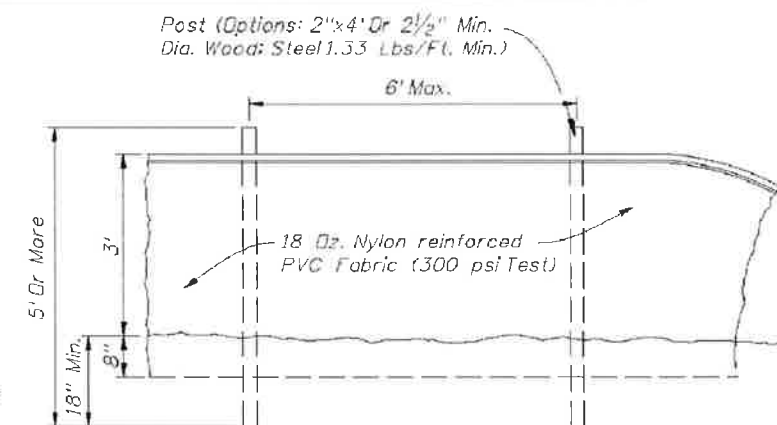


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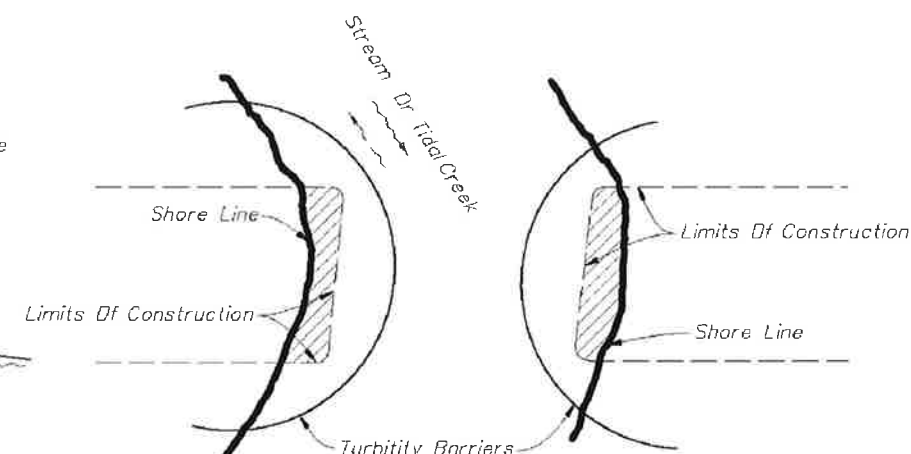
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the Standard Specifications.



TURBIDITY BARRIER APPLICATIONS



STAKED TURBIDITY BARRIER



Note:

Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractor's option unless otherwise specified in the plans, however payment will be under the pay item(s) established in the plans for Floating Turbidity Barrier and/or Staked Turbidity Barrier. Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

GENERAL NOTES

1. Floating turbidity barriers are to be paid for under the contract unit price for Floating Turbidity Barrier, LF.
2. Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, LF.



2010 FDOT Design Standards

TURBIDITY BARRIERS

Last Revision
07/01/07
Sheet No.
1 of 1
Index No.
103

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City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

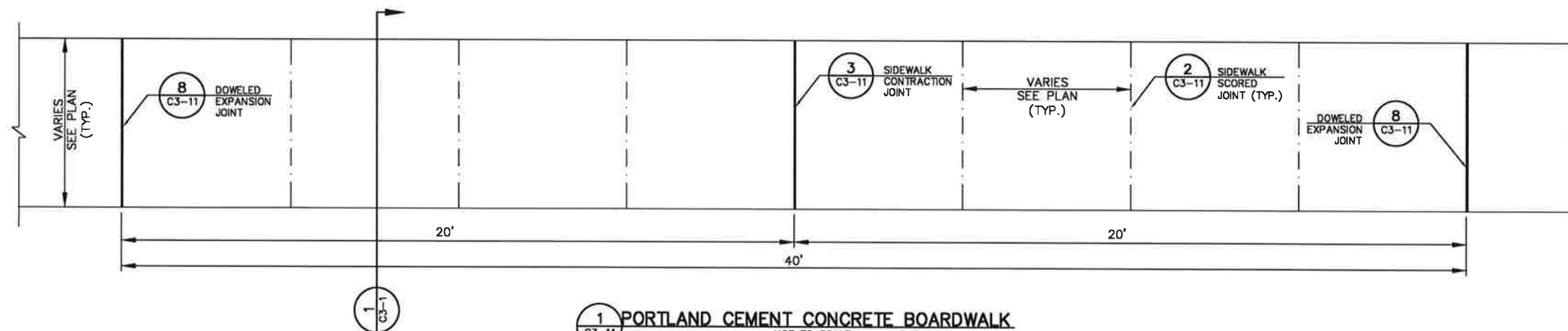
Passero Associates
4730 Cose Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 3438
Principal-in-Charge Andrew M. Halesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestege

Revisions			
No.	Date	By	Description

FDOT EROSION AND SEDIMENT CONTROL DETAILS

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida
Project No.
99000047.0095
Drawing No.
C3-9
Date
April 26, 2021

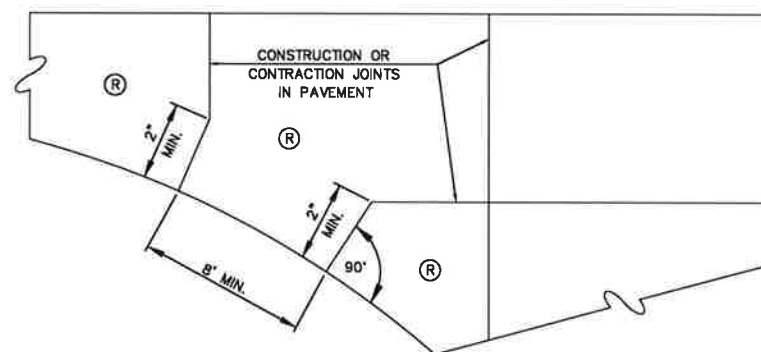
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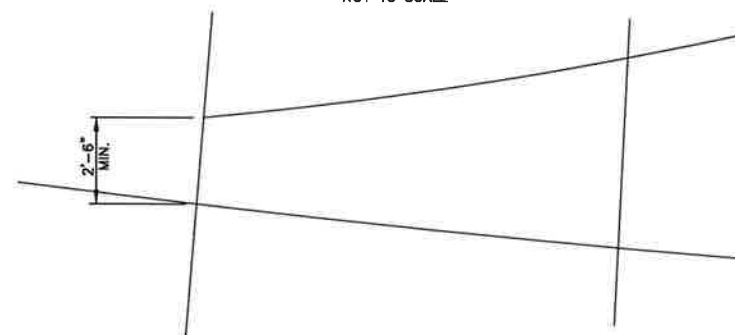
JOINT LOCATION NOTES:

FOR ENTIRE LENGTH OF NEW WALKWAY:

1. 1/2" EXPANSION JOINTS ARE TO BE LOCATED AT 40' INTERVALS.
2. CONTRACTION JOINTS ARE TO BE LOCATED 20' INTERVALS.
3. CONSTRUCTION JOINTS ARE TO LOCATED AS DIRECTED BY THE ENGINEER.
4. FOR SIDEWALKS MORE THAN 10' WIDE LONGITUDINAL JOINTS ARE REQUIRED. JOINT SPACING SHALL BE DETERMINED BY THE ENGINEER BUT WILL RESULT IN EQUALLY SPACED LONGITUDINAL JOINTS NOT EXCEEDING 10' IN WIDTH.
5. COST FOR ALL SIDEWALK JOINTS, JOINTS BETWEEN SIDEWALK AND OTHER PAVEMENTS/CURBS AND SEALANTS SHALL BE CONSIDERED INCIDENTAL TO COST OF SIDEWALK.
6. JOINTS SHALL BE LOCATED AT ANY CHANGE IN DIRECTION ON BOARDWALK. WHERE THE CHANGE IN DIRECTION EXCEEDS 10 DEGREES, TWO JOINTS SHALL BE PLACED STARTING AT THE "I"-CORNER AND EXTENDING PERPENDICULAR TO THE OPPOSITE END OF THE BOARDWALK.

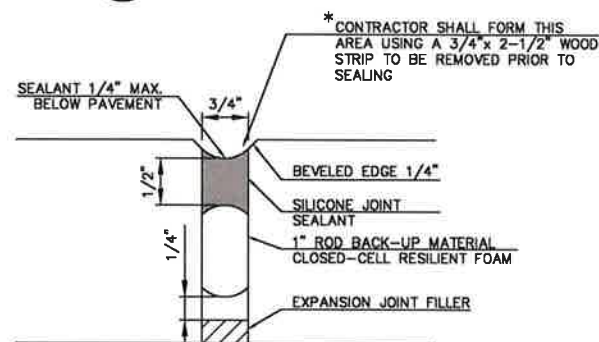


6 MINIMUM DISTANCE BETWEEN JOINTS ON CURVE AND ANGLED JOINT OR EDGE OF PAVEMENT DETAIL
NOT TO SCALE



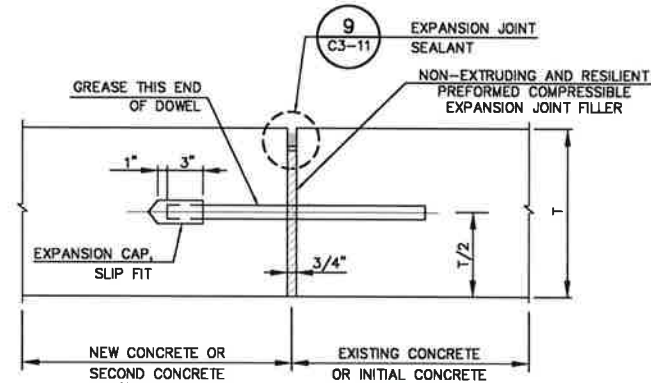
7 CONCRETE PAVEMENT MINIMUM PANEL DIMENSIONS
NOT TO SCALE

1 PORTLAND CEMENT CONCRETE BOARDWALK
NOT TO SCALE



9 DETAIL J EXPANSION JOINT SEAL
NOT TO SCALE

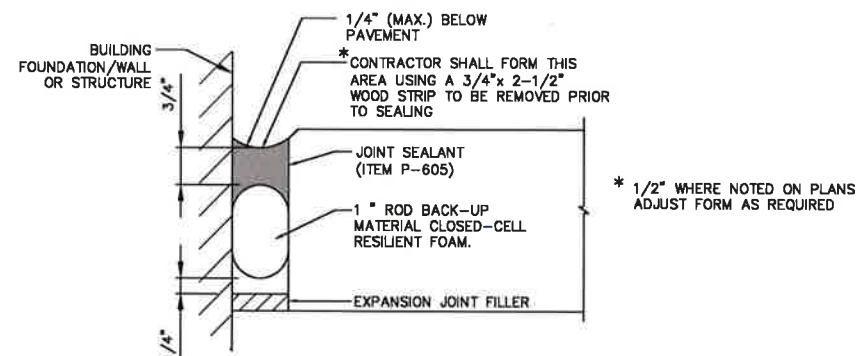
* 1/2" WHERE NOTED ON PLANS
ADJUST FORM AS REQUIRED



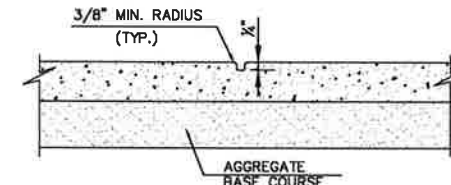
8 DOWELED EXPANSION JOINT
NOT TO SCALE

NOTES FOR DRILLING AND INSTALLING DOWEL BARS:

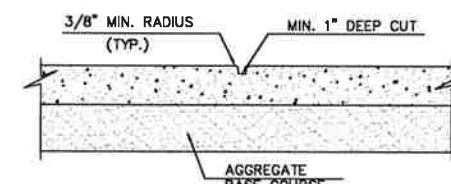
1. DRILLING METHOD SHALL BE CAPABLE OF MAINTAINING DRILL HOLES PARALLEL TO THE CONCRETE SURFACE AND NORMAL TO THE JOINT LINE WITHIN 1/4" ± AT THE END OF THE DOWEL BAR. DRILL HOLES SHALL BE ACCURATELY LAID OUT SO THAT THE MAXIMUM DEVIATION DOES NOT EXCEED 1". DRILL HOLE DIAMETER TO BE APPROXIMATELY 1 3/4". A MINIMUM OF THREE DAYS CURE TIME IS REQUIRED FOR DRILLING NEW CONCRETE UNLESS APPROVED BY THE ENGINEER.
2. AFTER DRILLING IS COMPLETE AND PRIOR TO THE INSTALLATION OF THE DOWELS, THE HOLES SHALL BE THOROUGHLY CLEANED TO REMOVE DRILLING DUST, CONCRETE CHIPS AND ANY MATERIAL DETRIMENTAL TO DEVELOPING BOND.
3. EPOXY MORTAR SHALL BE INSERTED INTO THE BACK OF THE DOWEL HOLE BY INJECTION NOZZLE AND SUFFICIENT MORTAR PLACED IN THE HOLE SO THAT A SLIGHT AMOUNT OF MORTAR WILL BE FORCED OUT WHEN THE DOWEL IS INSERTED AND TAPPED TO THE CORRECT POSITION. SMALL WEDGES MAY BE USED TO SUPPORT THE DOWEL IN THE CORRECT ALIGNMENT UNTIL THE MORTAR HARDENS. CONTRACTOR SHALL SUBMIT PROPOSED EPOXY MORTAR INFORMATION FOR APPROVAL BY THE ENGINEER PRIOR TO STARTING THIS WORK.



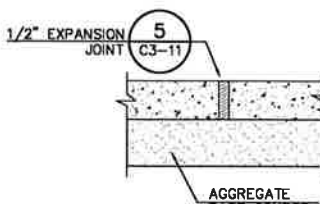
10 EXPANSION JOINT SEALANT AT BUILDINGS AND STRUCTURES
NOT TO SCALE



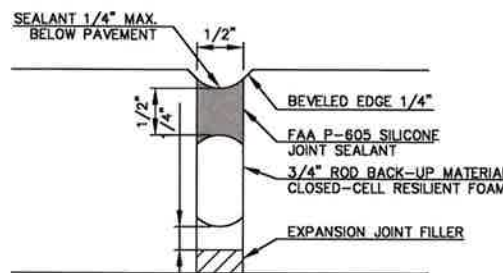
2 SIDEWALK SCORED JOINT
NOT TO SCALE



3 SIDEWALK CONTRACTION JOINT
NOT TO SCALE



5 EXPANSION JOINT SEAL
NOT TO SCALE



4 SIDEWALK EXPANSION JOINT
NOT TO SCALE

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Client:



City of Fernandina Beach

204 Ash St.

Fernandina Beach, Florida, 32034

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4130 Oak Creek Way, Suite 200
St. Augustine, FL 32085
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Certificate of Authorization # 3428
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Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredestage

Revisions			
No.	Date	By	Description

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BOARDWALK JOINT DETAILS

Amelia River Waterfront
Stabilization
Parking Lots C & D

Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C3-11

Date
May 10, 2021

Drawing name: F:\PASSERO\PHB\99000047.0095 FHB Waterfront\Report\04-01_FDOT-RAIL-DETAIL.dwg C:\projects\standards\structures\current\ready\release\201\Book\00862-1 of 6.dgn
5/21/2012 10:10:36 AM r0960r-h
by: EBraden
May 04, 2021 2:25pm



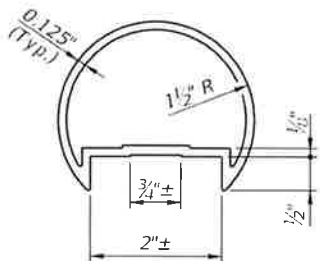
3D VIEW OF RAILING WITH TYPE 1 - PICKET INFILL PANEL
(42" Height shown, 54" Height Similar)

TABLE 1 - RAILING MEMBERS

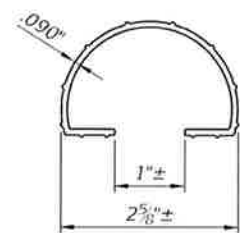
MEMBER	ALLOY ⁽¹⁾	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Posts	6061-T6	RT 2x2x.250	2.00" x 2.00"	0.250"
Top Rail	6061-T6	2 1/2" NPS (Sch. 10) 3" Round Top Cap Rail	2.875" 3.000"	0.120" 0.125"
End Hoops	6063-T5	2 1/2" NPS (Sch. 10) 3.00 OD x 0.125 Wall	2.875" 3.000"	0.120" 0.125"
Top Rail Joint/Splice Sleeves	6063-T5	2.50 OD x 0.125 Wall Top Cap Rail Inner Sleeve	2.500" 2.800"	0.125" 0.090"
Intermediate & Bottom Rail	6061-T6	RT 2x2x.250	2.00" x 2.00"	0.250" ⁽²⁾
Int. & Bottom Rail Post Connection Sleeve	6063-T5	1.50 OD x 0.125 Wall	1.500"	0.125"
Handrail Joint/Splice Sleeves	6063-T5	1" NPS (Sch. 40)	1.315"	0.133"
Handrails	6061-T6	1 1/2" NPS (Sch. 40)	1.900"	0.145"
Handrail Support Bar	6061-T6	3/4" Ø Round Bar	0.750"	N/A
Pickets (Type 1 Infill Panel)	6061-T6	3/4" Ø Round Bar	0.750"	N/A
Infill Panel Members (Types 2 - 5)	6063-T5	Varies (See Details)	Varies	Varies

TABLE 1 NOTES:

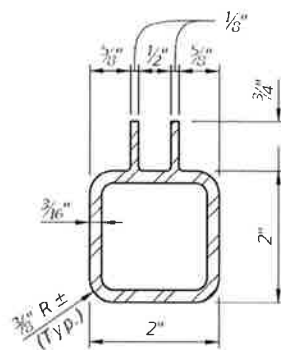
- (1) Alloy 6061-T6 or 6063-T52 & T6 may be substituted for Alloy 6063-T5.
(2) 0.188" wall thickness permitted for rails with post spacings less than 5'-9".



3" ROUND TOP CAP RAIL



TOP CAP RAIL INNER
SPLICE SLEEVE



ALTERNATIVE BOTTOM &
INTERMEDIATE RAIL SECTION
FOR TYPE 3, 4 & 5 RAILINGS

NOTES

DESIGN LOADS, GEOMETRY AND APPLICABILITY:

See the Instructions for Design Standards for the design loads, geometry and applicability requirements.

GENERAL:

Adequate foundation support shall be provided for anchorage and stability against overturning. See Index No. 861 for special requirements and modifications for use on bridges. The railing shown on these drawings requires a handrail for ramps steeper than a 5% grade to conform with the requirements of the Americans with Disabilities Act (ADA).

RAILS, PANELS AND POSTS:

Structural Extrusions, Tube, Pipe and Bar shall be in accordance with Table 1 and ASTM B221 or ASTM B429. Top, bottom and intermediate rail corner bends with maximum 4'-0" post spacing, may be Alloy 6063-T6. Perforated panels (Type 5) shall be Alloy 3003-H14. Posts shall be fabricated and installed plumb, $\pm 1"$ tolerance when measured at 3'-6" above the foundation. Pickets and vertical panel elements shall be fabricated parallel to the posts, except that Type 2, 3 & 5 panel infills may be fabricated parallel to the longitudinal grade. Corners and changes in tangential longitudinal alignment shall be made continuous with a 9" bend radius or terminate at adjoining sections with mitered end sections when handrails are not required. For changes in tangential longitudinal alignment greater than 45°, posts shall be positioned at a maximum distance of 2'-0" each side of the corner and shall not be located at the corner apex. For curved longitudinal alignments the top and bottom rails and handrails shall be shop bent to match the alignment radius.

BASE PLATES AND RAIL CAPS:

Base Plates and Post Cap plates shall be in accordance with ASTM B209, Alloy 6061-T6.

SHIM PLATES:

Shim Plates shall be aluminum in accordance with ASTM B209, Alloy 6061 or 6063. Shim plates shall be used for foundation height adjustments greater than 1/4" and localized irregularities greater than 1/8". Field trim shim plates when necessary to match the contours of the foundation. Beveled shim plates may be used in lieu of trimmed flat shim plates shown. Stacked shim plates must be bonded together with adhesive bonding material and limited to a maximum total thickness of 1/2", unless longer anchor bolts are provided for the exposed thread length.

ANCHOR BOLTS:

Anchor bolts shall be in accordance with ASTM F1554 Grade 36. Headless anchor bolts for Adhesive Anchors shall be threaded full length. Cutting of reinforcing steel is permitted for drilled hole installation. Expansion Anchors are not permitted. All anchor bolts shall have single self-locking hex nuts. Tack welding of the nut to the anchor bolt may be used in lieu of self-locking nuts. All nuts shall be in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only), shall be in accordance with ASTM A36 or ASTM A709 Grade 36. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and tack welds shall be coated with a galvanizing compound in accordance with the Specifications.

RESILIENT AND NEOPRENE PADS:

Resilient and Neoprene pads shall be in accordance with Specification Section 932 except that testing of the finished pads shall not be required. Neoprene pads shall be durometer hardness 60 to 80.

JOINTS:

All welded joints are to be ground smooth. Expansion joints shall be spaced at a maximum 35'-0". Field splices similar to the expansion joint detail may be approved by the Engineer to facilitate handling, but top rail must be continuous across a minimum of two posts.

WELDING:

All welding shall be in accordance with the American Welding Society Structural Welding Code (Aluminum) ANSI/AWS D1.2 (current edition). Filler metal shall be either ER5183, ER5356 or ER5556. Nondestructive testing of welds is not required. Filler metal for plug welds and bend splices may be ER4043.

COATINGS:

The aluminum railing shall be mill finish unless otherwise noted in the Contract Documents. All nuts, bolts and washers shall be hot-dip galvanized in accordance with Specification Section 962.

SHOP DRAWINGS:

Complete details addressing project specific geometry (line & grade) showing post and expansion joint locations, post and panel type, anchor bolt installation "Case" or lengths, must be submitted by the Contractor for the Engineer's approval prior to fabrication of the railing. Shop drawings shall be in accordance with the Specifications.

PAYMENT:

Railing shall be paid for per linear foot (Item No. 515-2-abb). Payment will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, pickets, panels, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the railing.

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Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
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Revisions

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**FDOT
ALUMINUM
RAILING
DETAILS**
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C4-1

Date
April 26, 2021

LAST
REVISION
01/01/12

DESCRIPTION:



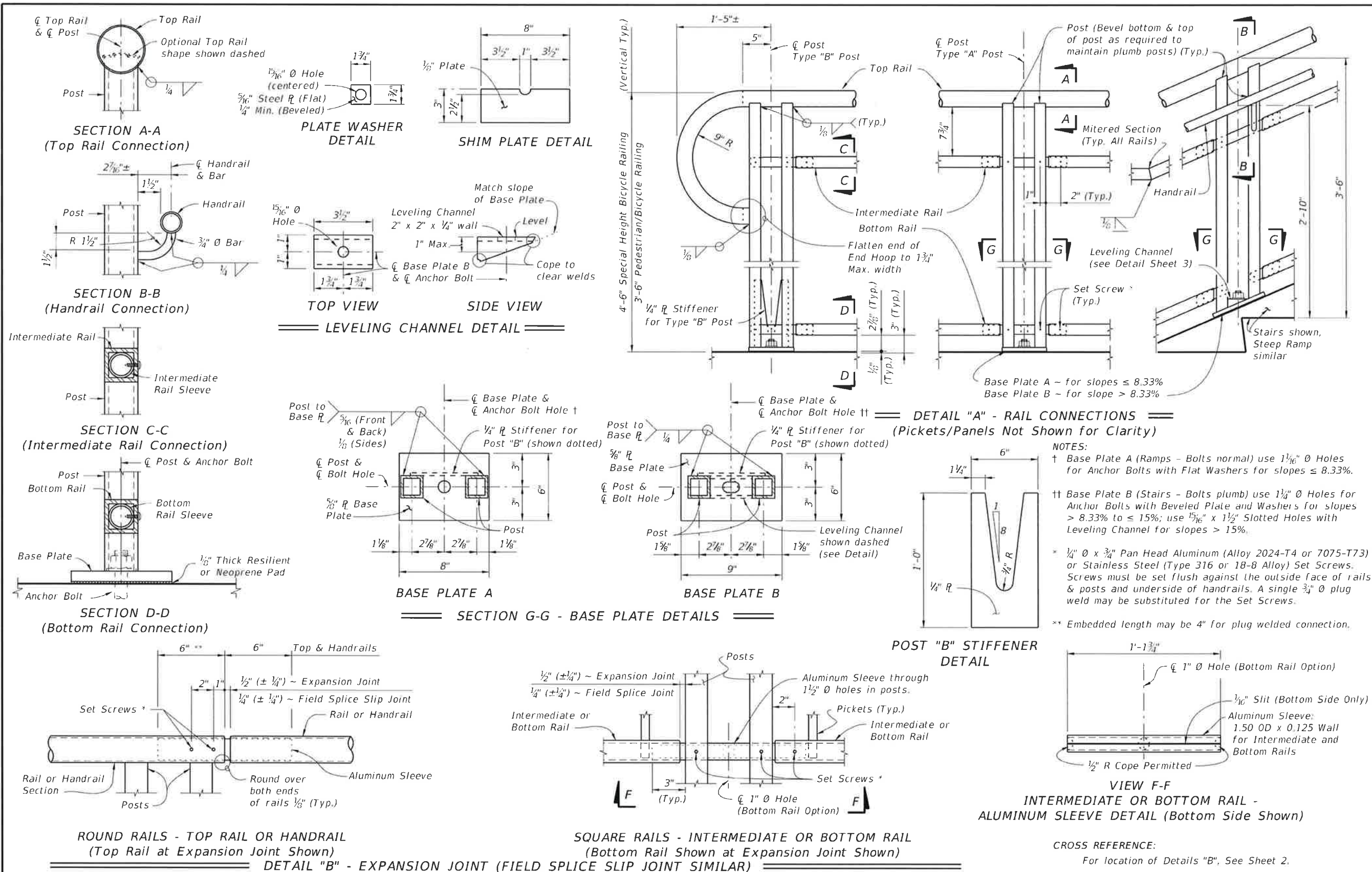
**FDOT DESIGN STANDARDS
2013**

ALUMINUM PEDESTRIAN/BICYCLE RAILING

INDEX
NO.
862

SHEET
NO.
1

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6/26/2012 11:36:14 AM r096011
C4-2_FDOT-RAIL May 04, 2021 2:28pm by EBredestege



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204 Ash St.
Fernandina Beach, Florida, 32034

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4730 Cren Cole Way, Suite 100 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 2438
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestege

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**FDOT
ALUMINUM
RAILING
DETAILS**

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C4-2

Date
April 26, 2021

LAST REVISION	DESCRIPTION:
07/01/12	

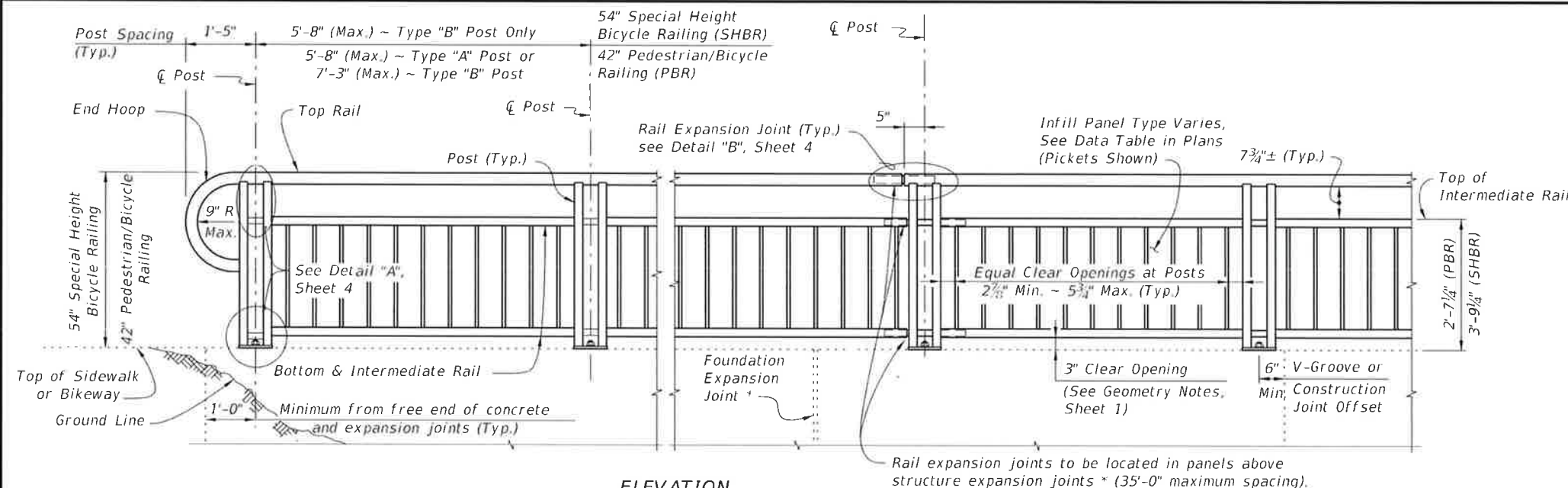


**FDOT DESIGN STANDARDS
2013**

ALUMINUM PEDESTRIAN/BICYCLE RAILING

INDEX NO.
862
SHEET NO.
4

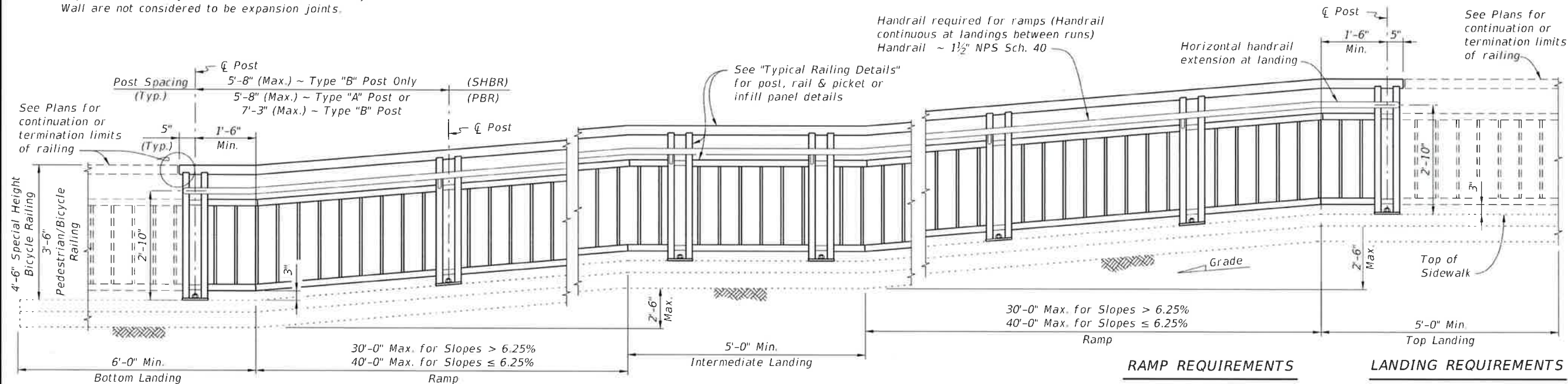
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C4-3_FDOT-RAIL May 04, 2021 2:29am by: EBredestage



ELEVATION
(Showing Outside Face of Railing with Type "A" Posts)

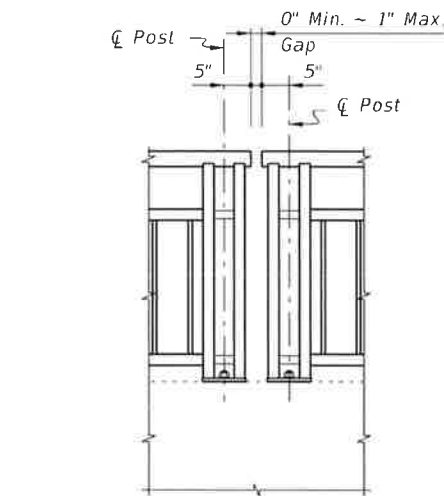
TYPICAL RAILING DETAILS & RAILINGS ON GRADES 0% TO 5%
(Type 1 - Picket Railing Shown, Other Types Similar)

NOTES:
+ Keyed construction joints in Index No. 6011 Gravity Wall are not considered to be expansion joints.



ELEVATION
(Showing Inside Face of Railing with Type "A" Posts)

RAILINGS ON GRADES STEEPER THAN 5%
(Type 1 - Picket Railing Shown, Other Types Similar)



Note: Non-continuous corners are permitted when handrails are not required.

EXPANDED ELEVATION AT CORNERS

DETAIL FOR NON-CONTINUOUS RAILING AT CORNERS

RAMP REQUIREMENTS

For slopes greater than 5%:
Max. ramp slope = 8.33%
Max. ramp cross-slope = 2.0%

LANDING REQUIREMENTS

Max. landing slope = 2%
Max. landing cross-slope = 2%

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City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

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4730 Case Cole Way, Suite 200 (904) 757-6106
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Project Manager Christopher Nardone, AIA
Designed by Emily Bredestage

Revisions			
No.	Date	By	Description

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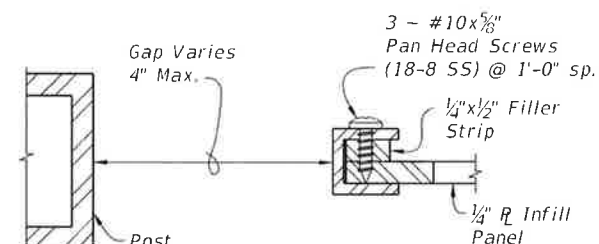
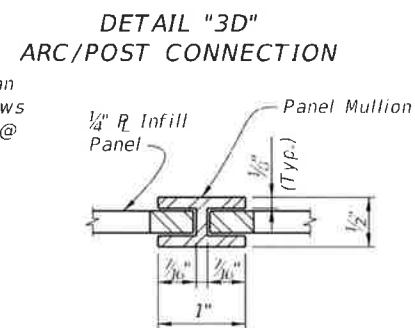
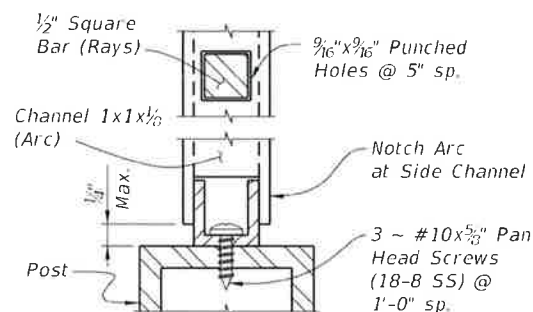
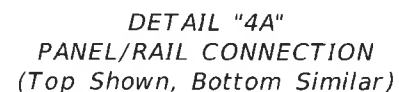
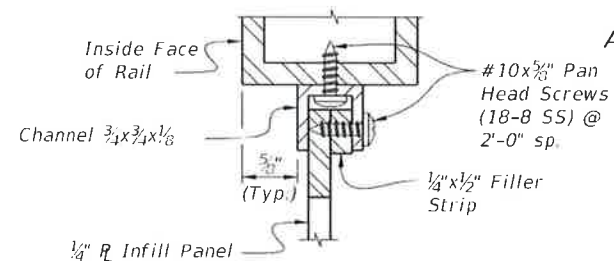
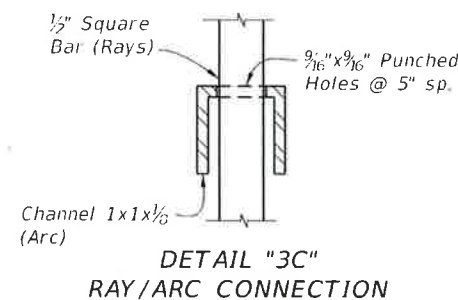
FDOT ALUMINUM RAILING DETAILS
Amelia River Waterfront Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

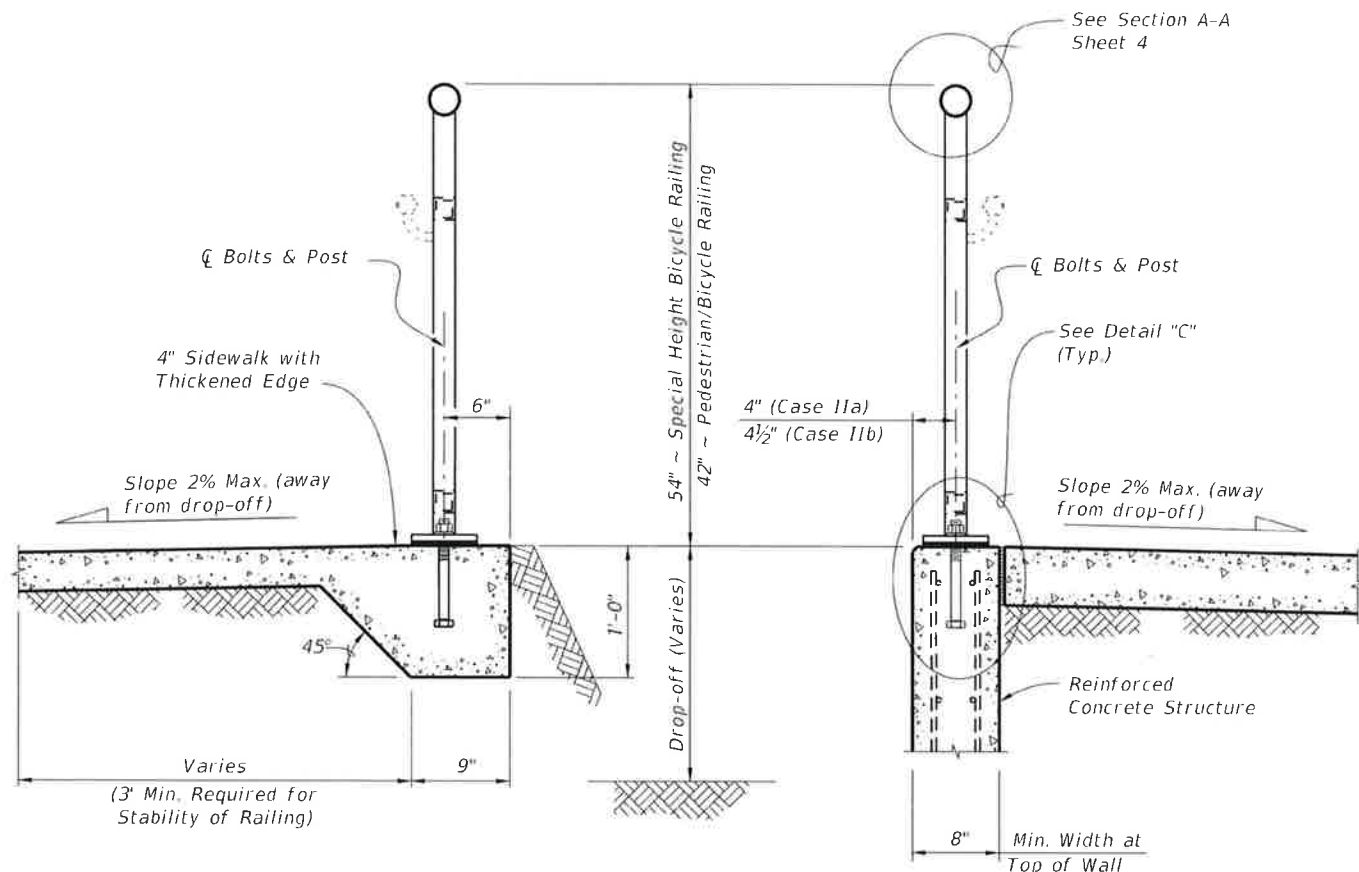
Drawing No.
C4-3

Date
April 26, 2021

LAST REVISION	DESCRIPTION:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	FDOT DESIGN STANDARDS 2013	ALUMINUM PEDESTRIAN/BICYCLE RAILING	INDEX NO. 862	SHEET NO. 2
01/01/11						

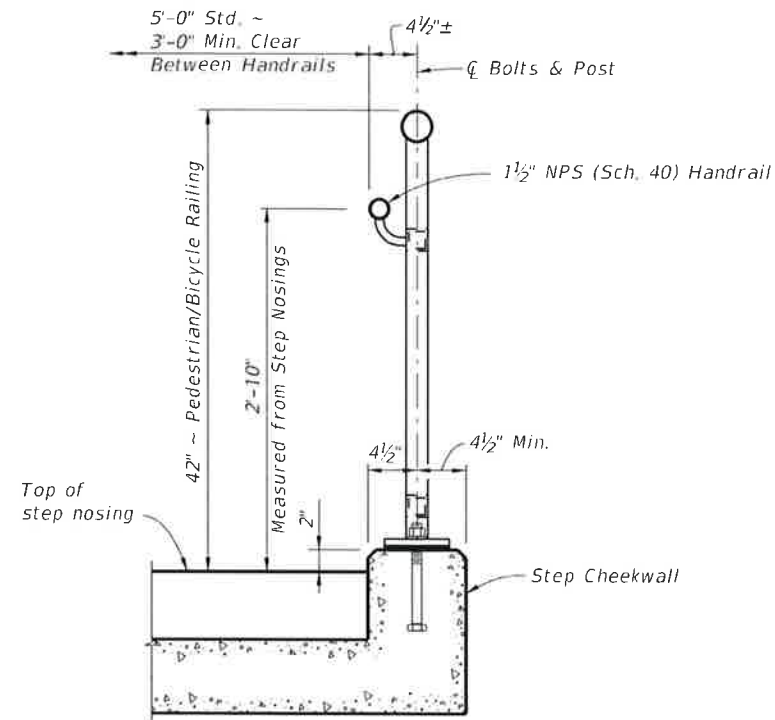
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C4-5_FDOT-RAIL May 04, 2021 2:31am by EBredestoge

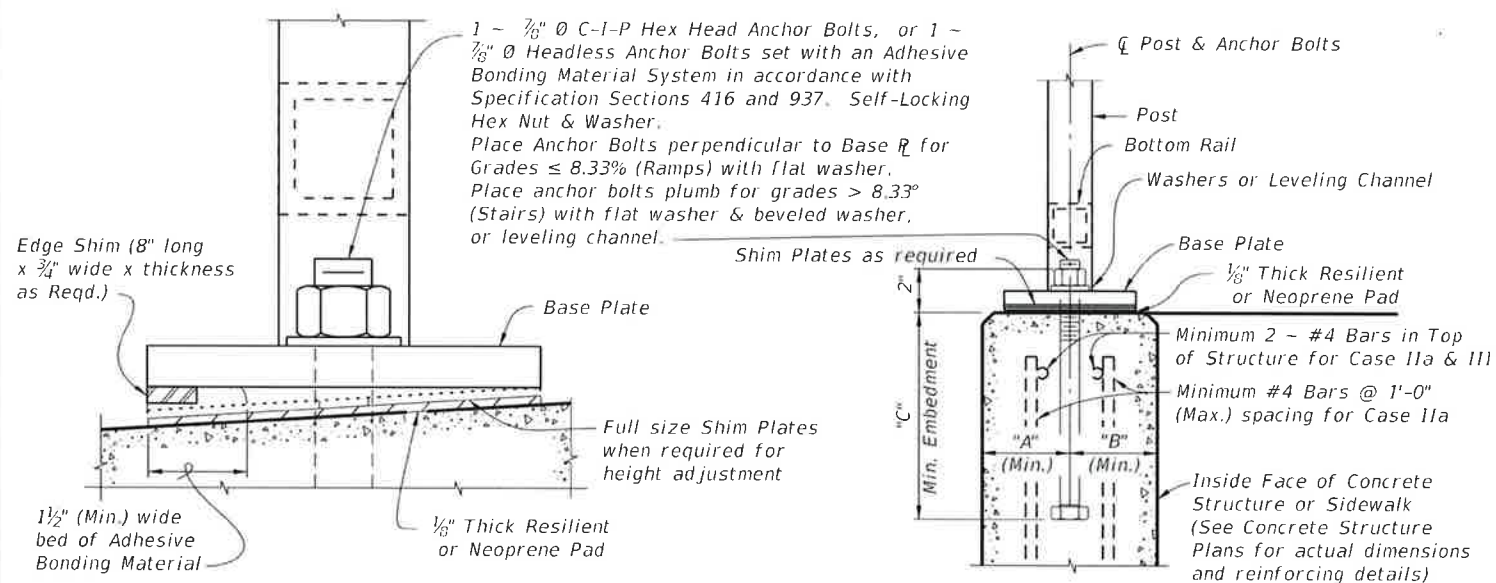


TYPICAL SECTION ON CONCRETE SIDEWALK
(Case I)

TYPICAL SECTION ON RETAINING WALL
(Case II)



TYPICAL SECTION ON STEPS & STAIRS
(Case III)



DETAIL "D" (OPTIONAL SHIMMING DETAIL
FOR CROSS SLOPE CORRECTION)
(Used in lieu of Beveled Shim Plates)

DETAIL "C"
(Cast-In-Place Anchor Bolts shown,
Adhesive Anchors similar)

ANCHOR BOLT TABLE							
CASE	STRUCTURE TYPE	DIMENSIONS			ANCHOR LENGTH		ANCHOR SIZE
		"A" Edge Dist.	"B" Edge Dist.	"C" Embedment	C.I.P. Hex Head Bolt	Adhesive Anchor	
I	Unreinforced Concrete	6"	1'-2"	9"	10 1/2"	11"	3/8" Ø
IIa	Reinforced Concrete	4"	4"	9"	10 1/2"	11"	3/8" Ø
IIb	Gravity Wall Index No. 6011	4 1/2"	3 1/2" @ top	1'-0" *	1'-1 1/2"	1'-2"	3/8" Ø
III	Step Cheekwall	4 1/2"	4 1/2"	9"	10 1/2"	11"	3/8" Ø

* Embedment length "C" may be reduced to 9" for the 42" height railings for Case IIb, when the post spacing does not exceed 5'-0".

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204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Cass Cole Way, Suite 200
St. Augustine, FL 32095
Principal-in-Charge: Andrew M. Volesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredestoge

Revisions			
No.	Date	By	Description

**FDOT
ALUMINUM
RAILING
DETAILS**
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C4-5

Date
April 26, 2021

LAST REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	ALUMINUM PEDESTRIAN/BICYCLE RAILING	INDEX NO. 862	SHEET NO. 8
07/01/12					

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10/14/2019 11:04:35 AM

NOTES:

1. Shop Drawings are required.
2. Work with Specification 515.
3. Materials:
 - A. Pan Head Set Screws: Aluminum Alloy 2024-74 or 7075-T73 or Stainless Steel (SS) Type 316 or 18-8 Alloy.
 - B. Base Plates and Cap Plates: ASTM B209, Alloy 6061-T6
 - C. Structural Pipe Tube and Bars: ASTM B221 or ASTM B429, Alloy 6061-T6
 - D. End Rails 90 bends and corner bends with a maximum 4 foot spacing: Alloy 6063-T5 is permitted.

RAILING MEMBER DIMENSIONS TABLE			
MEMBER	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Posts	2" NPS (Sch. 40)	2.375"	0.154"
Rails	2" NPS (Sch. 40)	2.375"	0.154"
Rail Joint/Splice Sleeves	1½" NPS (Sch. 40)	1.900"	0.145"
Handrails Joint/Splice Sleeves	1" NPS (Sch. 40) 1.50 ODx0.125 Wall	1.315" 1.500"	0.133" 0.125"
Handrails	1½" NPS (Sch. 40)	1.900"	0.145"
Handrail Support Bar	1" Ø Round Bar	1.000"	N/A

- E. Galvanized Steel Fasteners:
 - a. Hex Head Bolts: ASTM A 307 Type 1 or ASTM F1554 Grade 36
 - b. Adhesive Anchors: ASTM F1554 Grade 36 fully threaded rods
 - c. Hex Nuts: ASTM A563
 - d. Flat Washers: ASTM F436
 - F. Aluminum Shims: ASTM B209, Alloy 6061
 - G. Bearing Pads: Plain, Fabric Reinforced, or Fabric Laminated meeting requirements of Specifications 515 & 932.
4. Fabrication:
- A. Place expansion joints at a maximum of 30'-0" spacing
 - B. Field splices are similar to the expansion joint detail and may be approved by the Engineer to facilitate handling; but top rail must be continuous across a minimum of two posts.
 - C. Continuity field splice (Detail "E"); only use to make the railing continuous for unforeseen field adjustments
 - D. Corners and changes in tangential longitudinal alignment may be made continuous with a 9" bend radius or terminated at adjoining sections with a standard end hoop when handrails are not required.
 - E. For curved longitudinal alignments, shop bend top and bottom rails and handrails to match the alignment radius.
 - F. For changes in tangential longitudinal alignment greater than 45°, position posts a maximum of 2'-0" each side of the corner, not at the corner apex.
5. Handrails are required and must be continuous at landings for:
- A. Grades Steeper than 5%
 - B. Three or more steps
6. Cutting of reinforcing steel is permitted for post installed anchor bolts.

LAST REVISION	DESCRIPTION:	FDOT FY 2020-21 STANDARD PLANS		PIPE GUIDERAIL (ALUMINUM)		INDEX	SHEET
11/01/18						515-070	1 of 5



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FDOT
GUIDERAIL
(ALUMINUM)

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

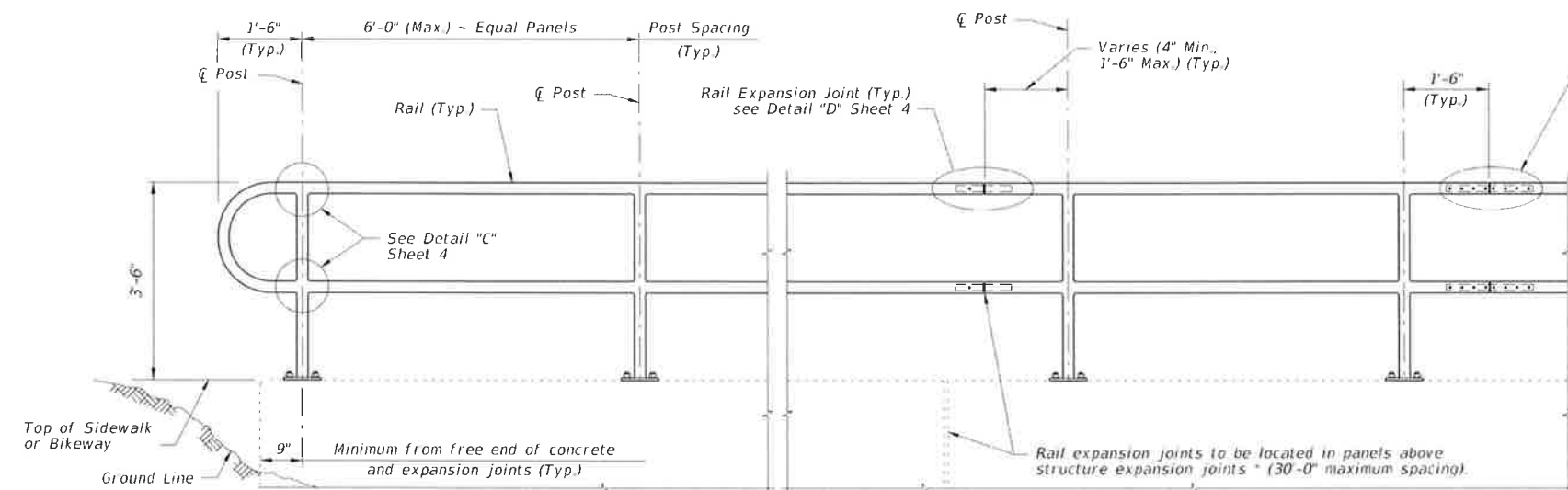
Project No.
99000047.0095

Drawing No.
C4-6

Date
May 10, 2021

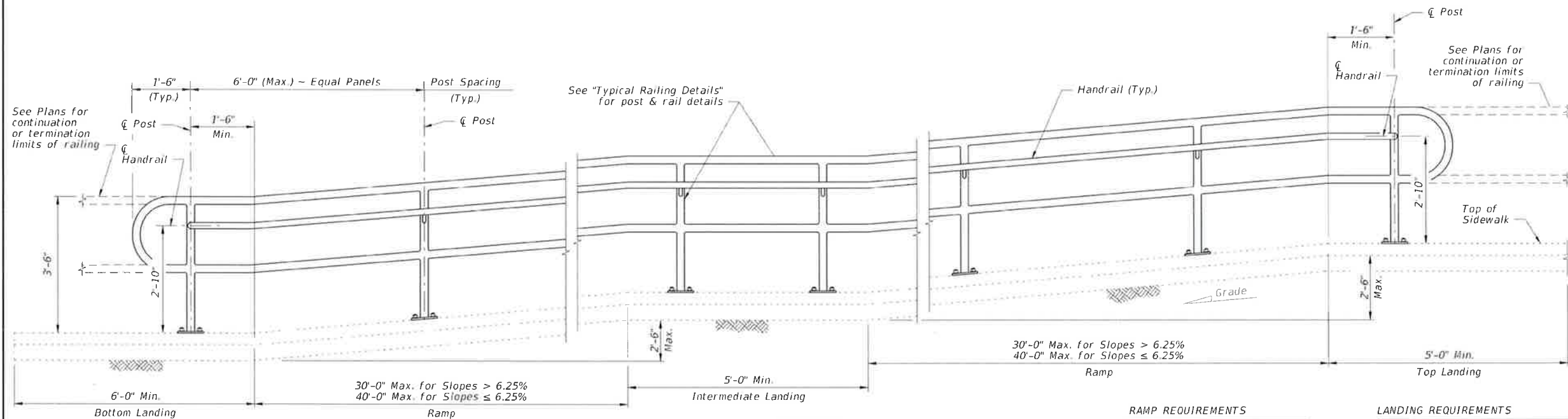
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10/14/2019 11:04:38 AM



ELEVATION

TYPICAL RAILING DETAILS & RAILINGS ON GRADES 0% TO 5%



ELEVATION
(Showing Inside Face of Railing)

RAILINGS ON GRADES STEEPER THAN 5% TO 8.33%

NOTES:
NPS = Nominal Pipe Size
STRUCTURES EXPANSION JOINTS NOTE:
* Keyed construction joints in Index 400-011 Gravity Wall are not considered to be expansion joints.

CROSS REFERENCE:
For Details "C", "D" and "E", see Sheet 4.

RAMP REQUIREMENTS
For slopes greater than 5%:
Max. ramp slope = 8.33%
Max. ramp cross-slope = 2.0%

LANDING REQUIREMENTS
Max. landing slope = 2%
Max. landing cross-slope = 2%

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FDOT
GUIDERAIL

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

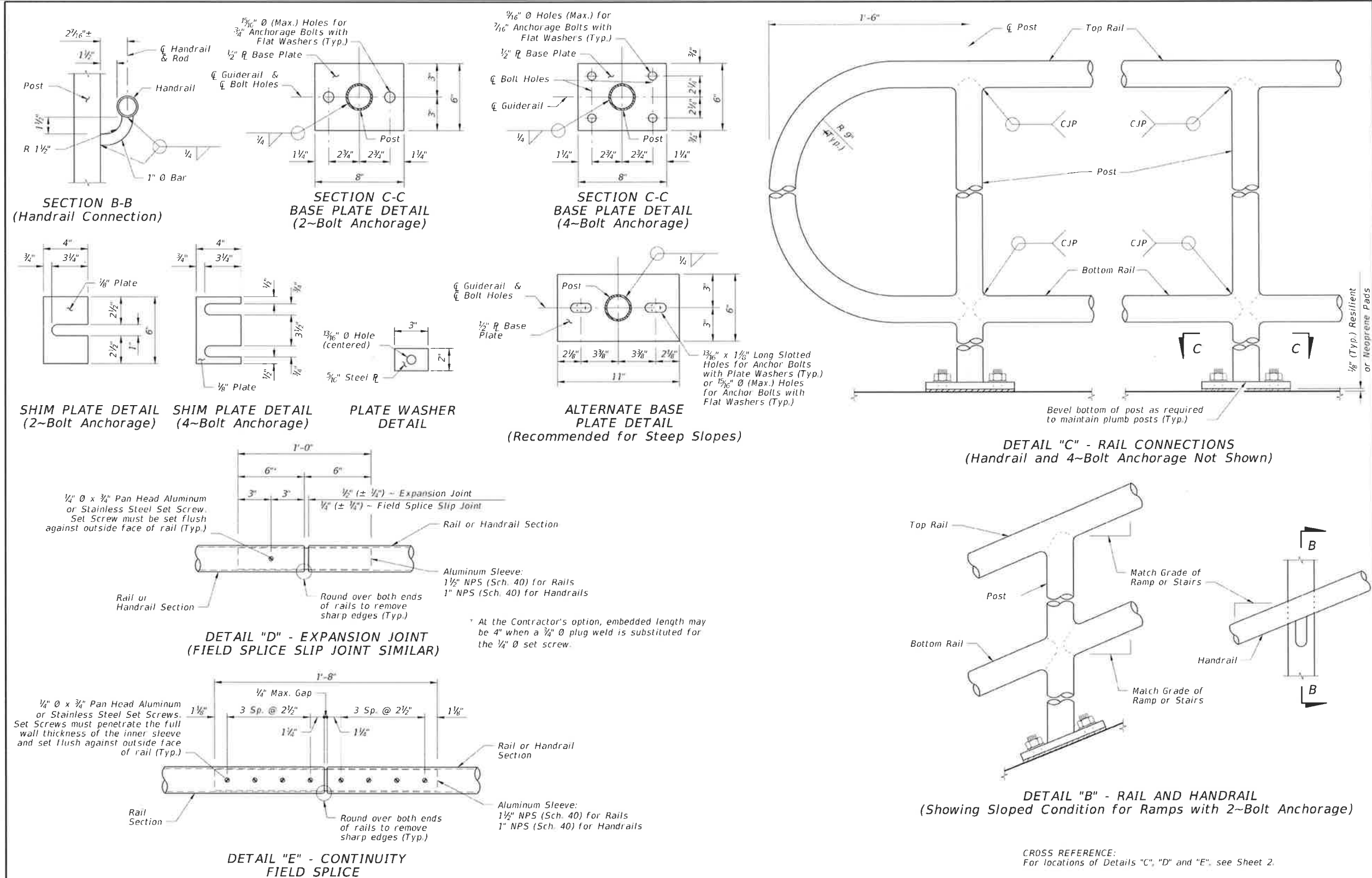
Drawing No.
C4-7

Date
May 10, 2021

LAST REVISION	DESCRIPTION:	FDOT	FY 2020-21 STANDARD PLANS	PIPE GUIDERAIL (ALUMINUM)	INDEX	SHEET
11/01/17					515-070	2 of 5

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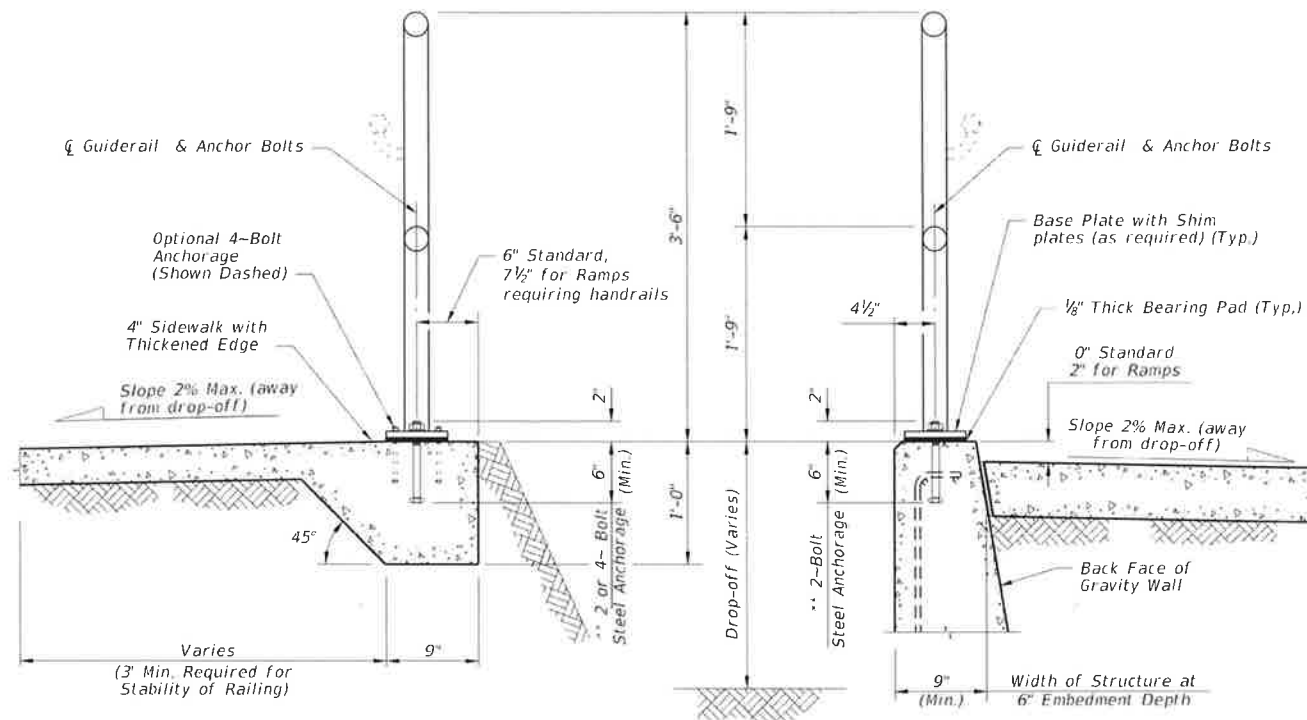
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11/01/17					515-070	4 of 5

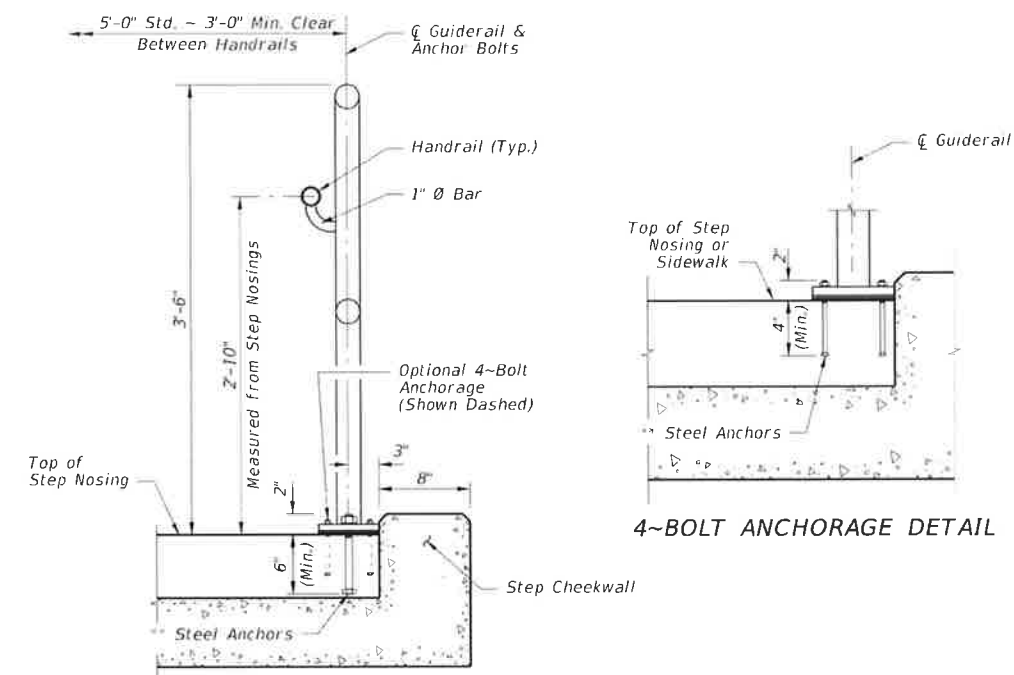
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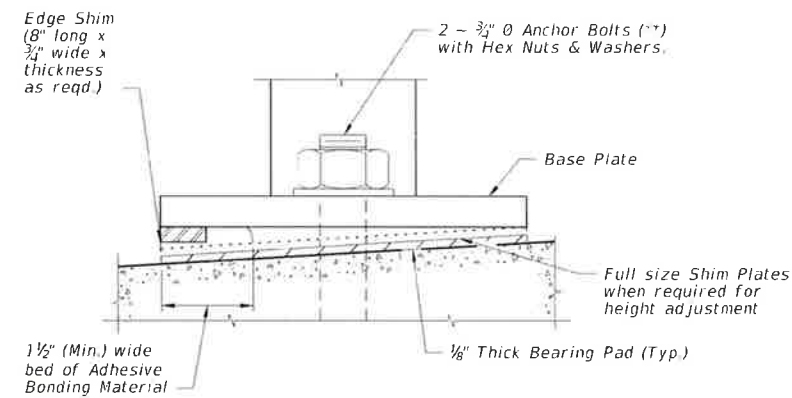
TYPICAL SECTION ON CONCRETE SIDEWALK

TYPICAL SECTION ON GRAVITY WALL
(Other Retaining Walls Similar)

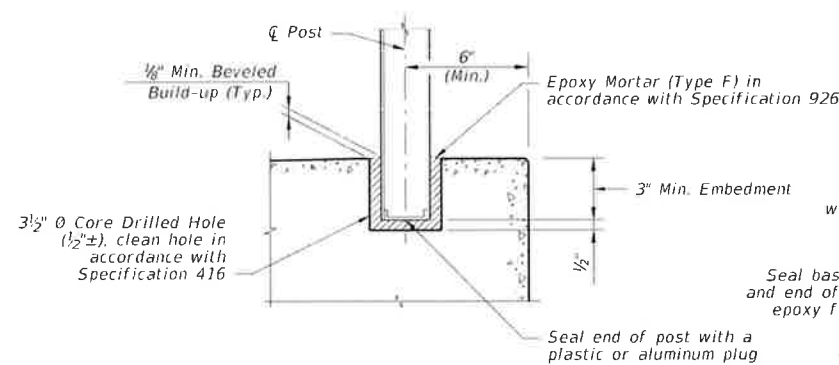


TYPICAL SECTION ON STEPS & STAIRS

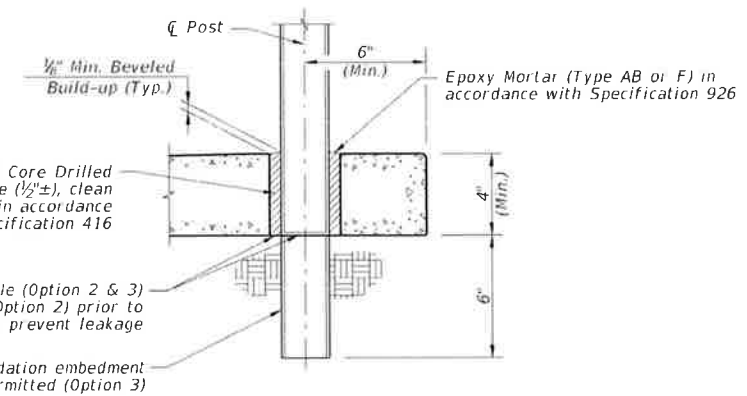
4-BOLT ANCHORAGE DETAIL



DETAIL "F" (OPTIONAL SHIMMING DETAIL
FOR CROSS SLOPE CORRECTION)
(Used in lieu of Beveled Shim Plates)



SIDEWALK ANCHORAGE DETAIL
OPTION 1



SIDEWALK ANCHORAGE DETAIL
OPTION 2 & 3

NOTES:
1. 2 - 3/4" ϕ x 8" or 4 - 7/8" ϕ x 6" Steel Anchors:
Galvanized Steel Bolts (As Shown) (C-I-P); Galvanized U-Bolts
Permitted (C-I-P); Galvanized Adhesive Anchors Permitted

2. The minimum embedment for Adhesive Anchors is 6" for
2-Bolt Anchorage or 4" for 4-Bolt Anchorage.

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Project Manager: Christopher Nardone, AIA
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**FDOT
GUIDERAIL**

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
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Drawing No.
C4-9

Date
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REVISION
11/01/17

REVISION

DESCRIPTION:



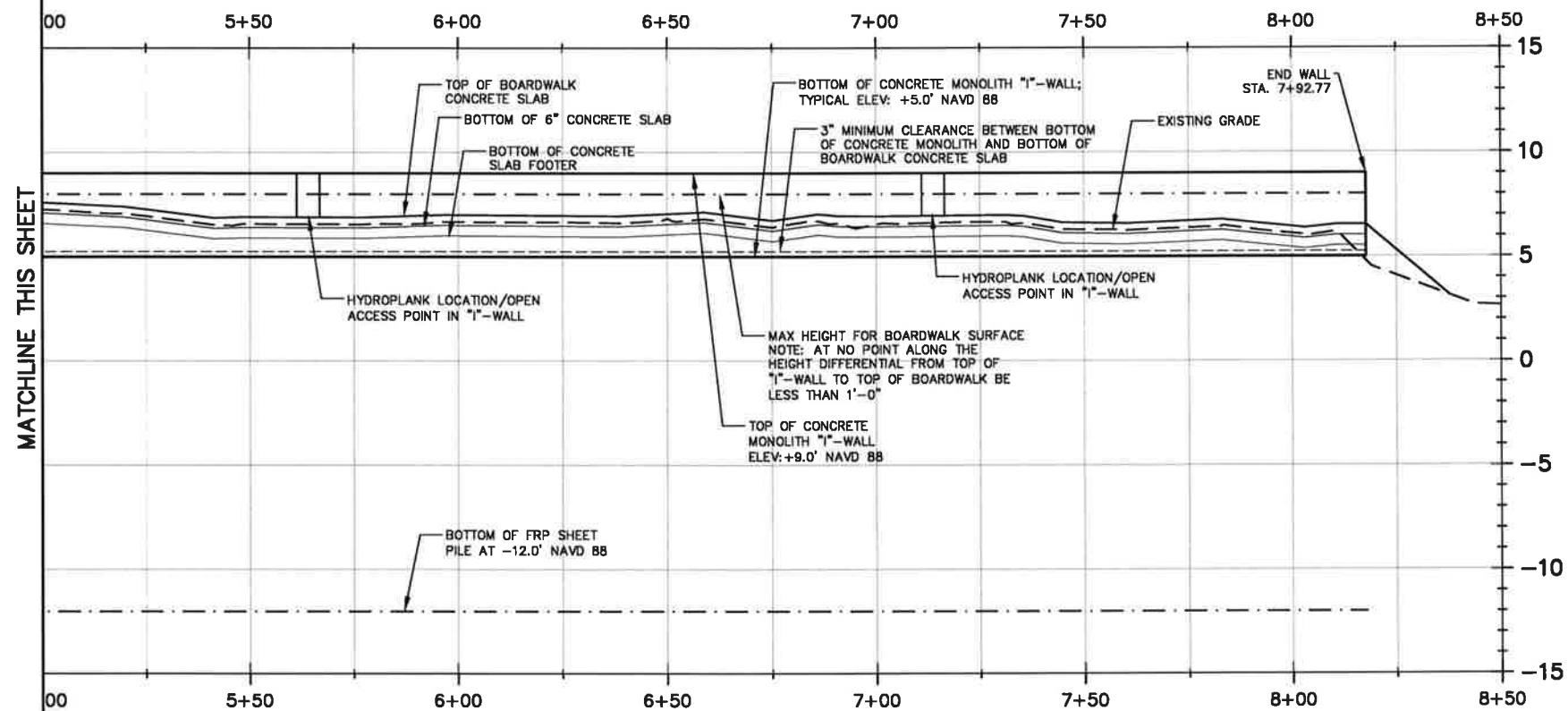
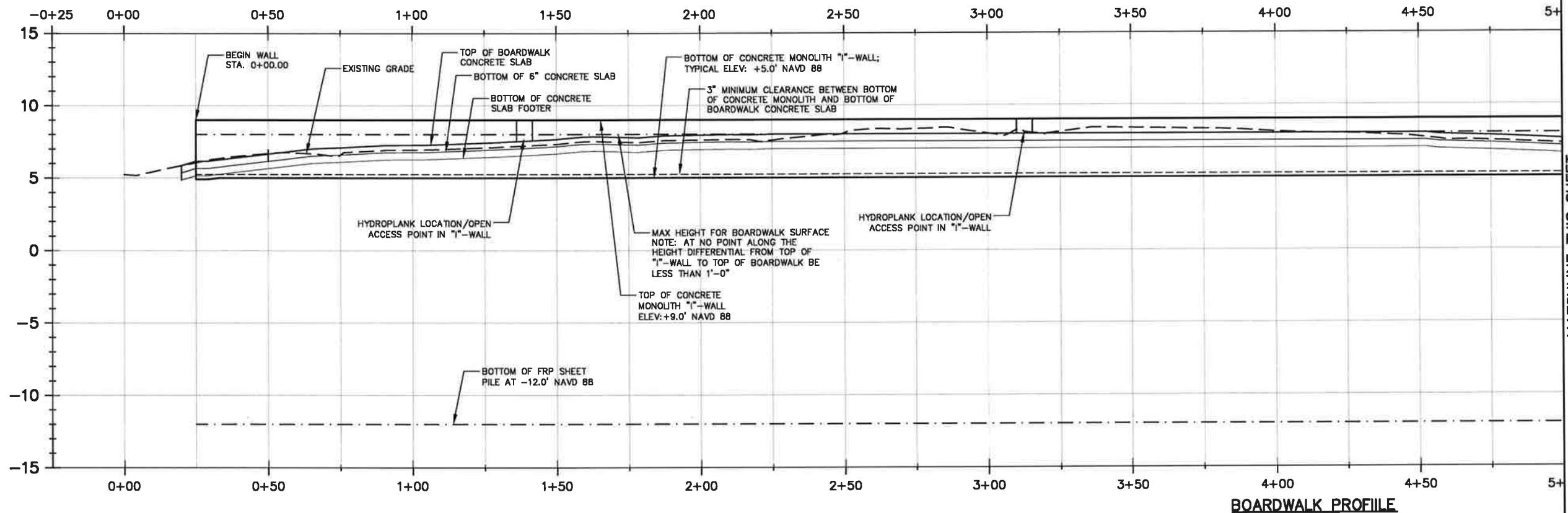
FY 2020-21
STANDARD PLANS

PIPE GUIDERAIL (ALUMINUM)

INDEX
515-070

SHEET
5 of 5

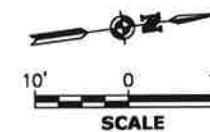
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BOARDWALK AND "I"-WALL PROFILE

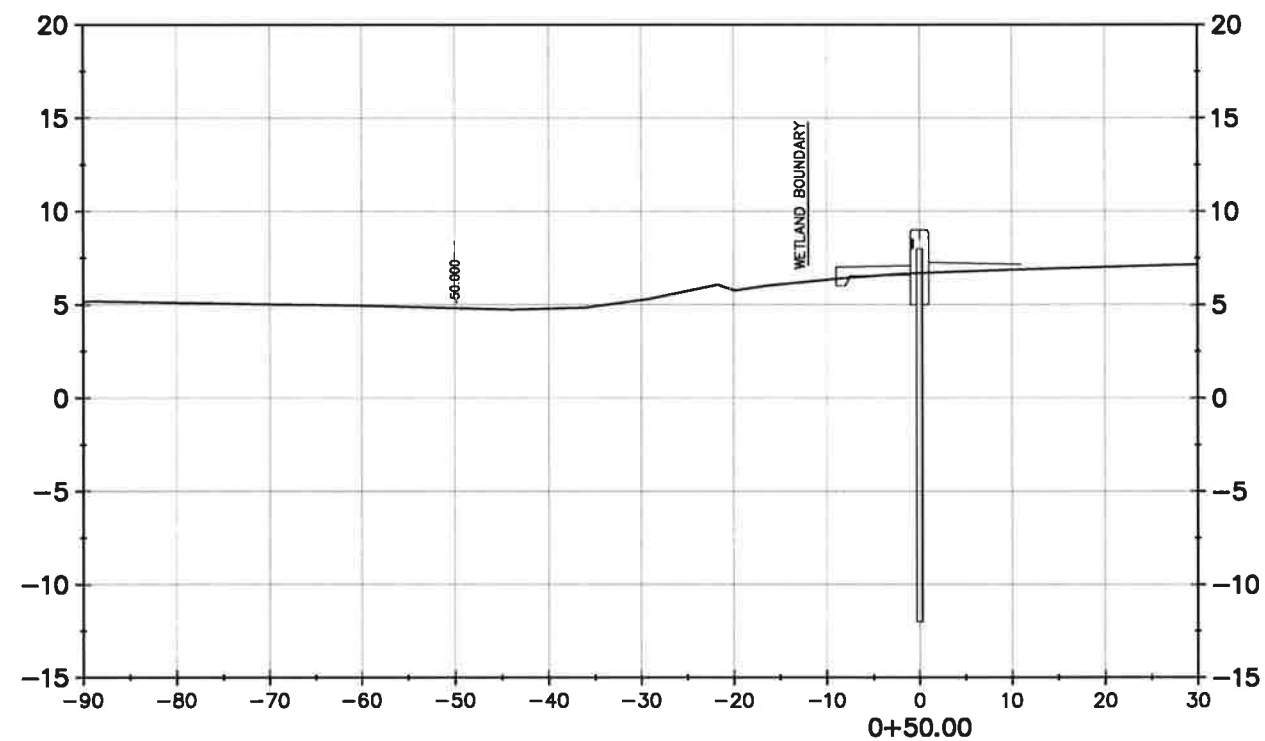
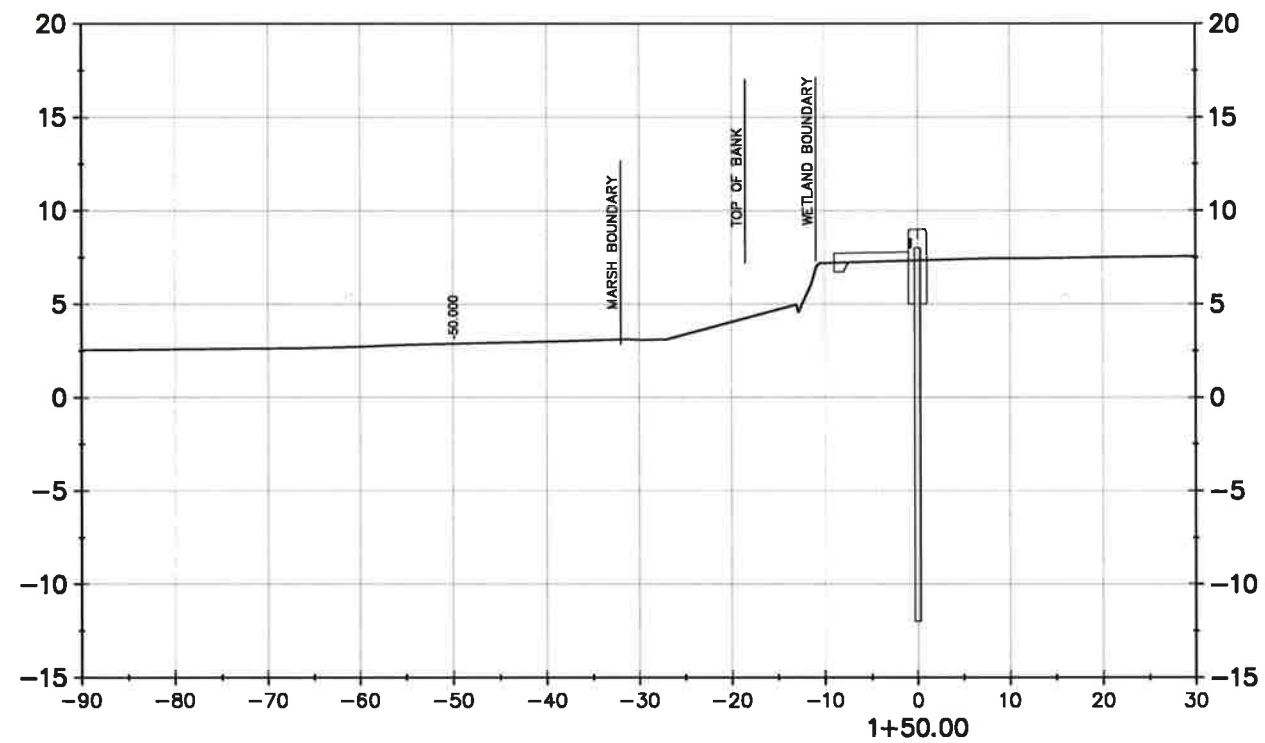
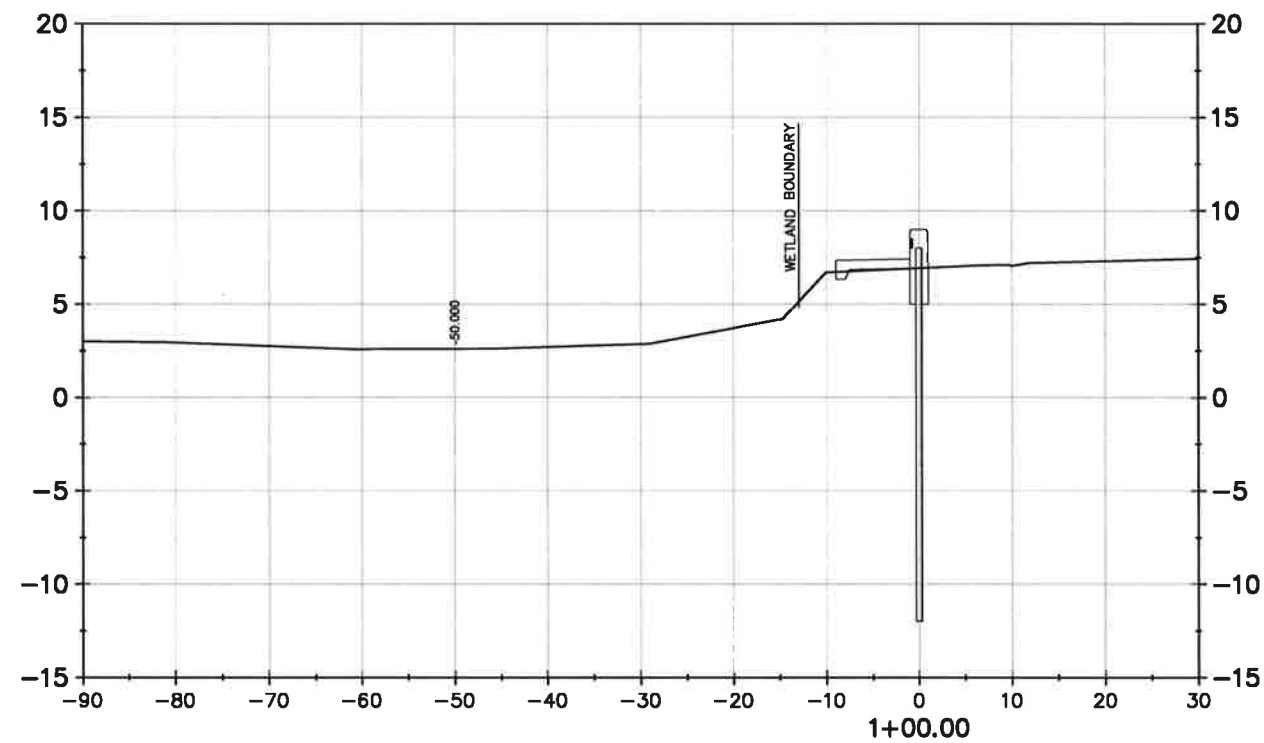
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

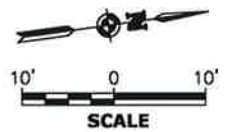
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C5-1

Date
May 10, 2021

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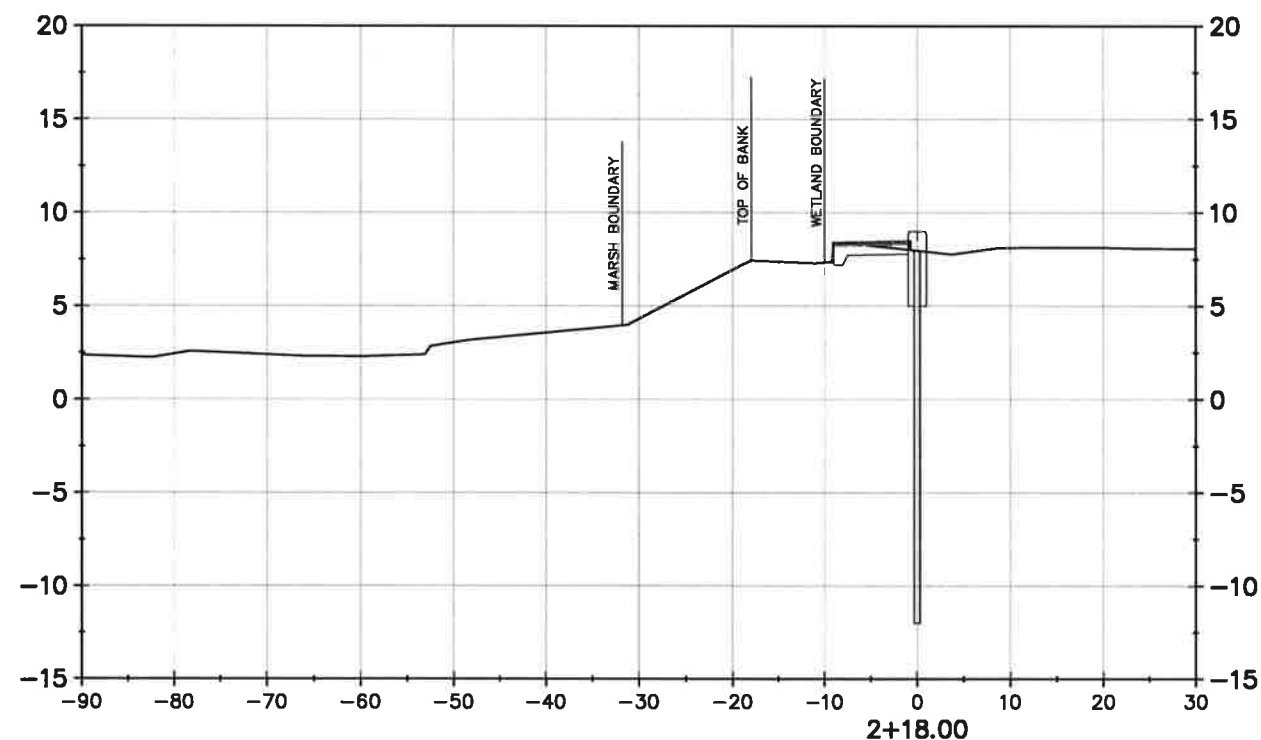
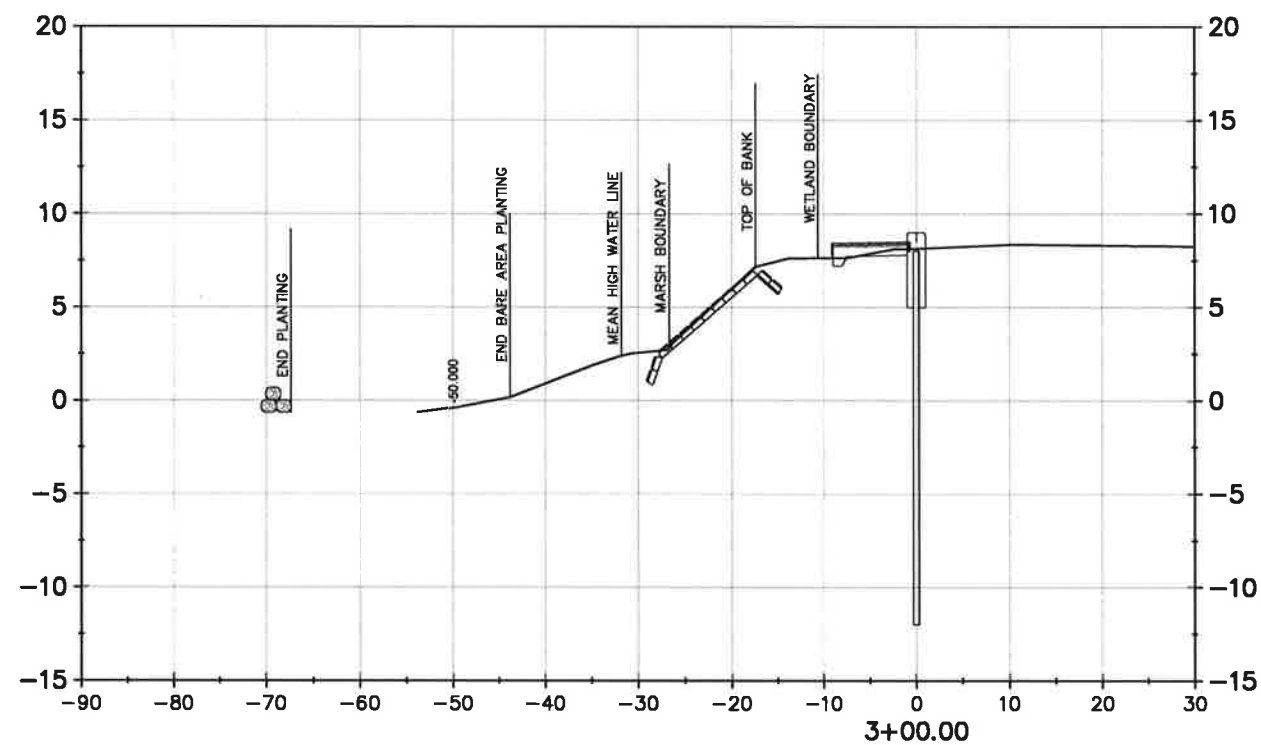
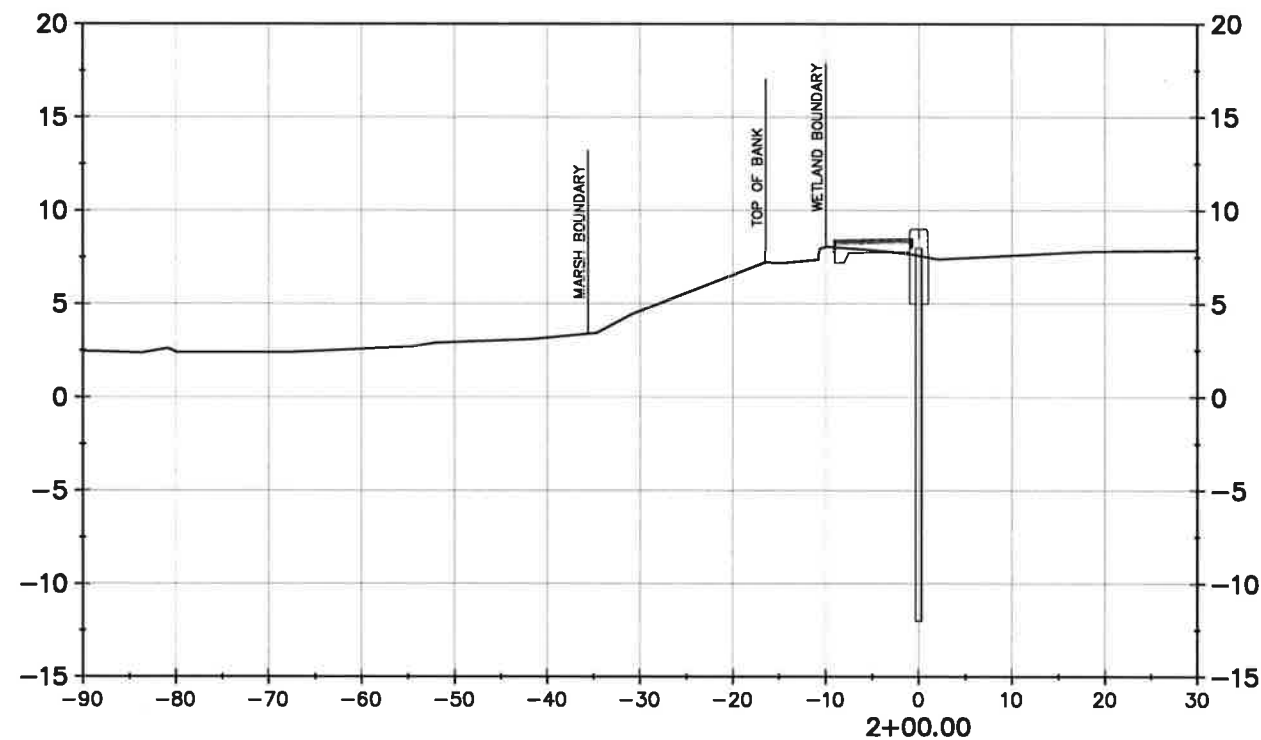
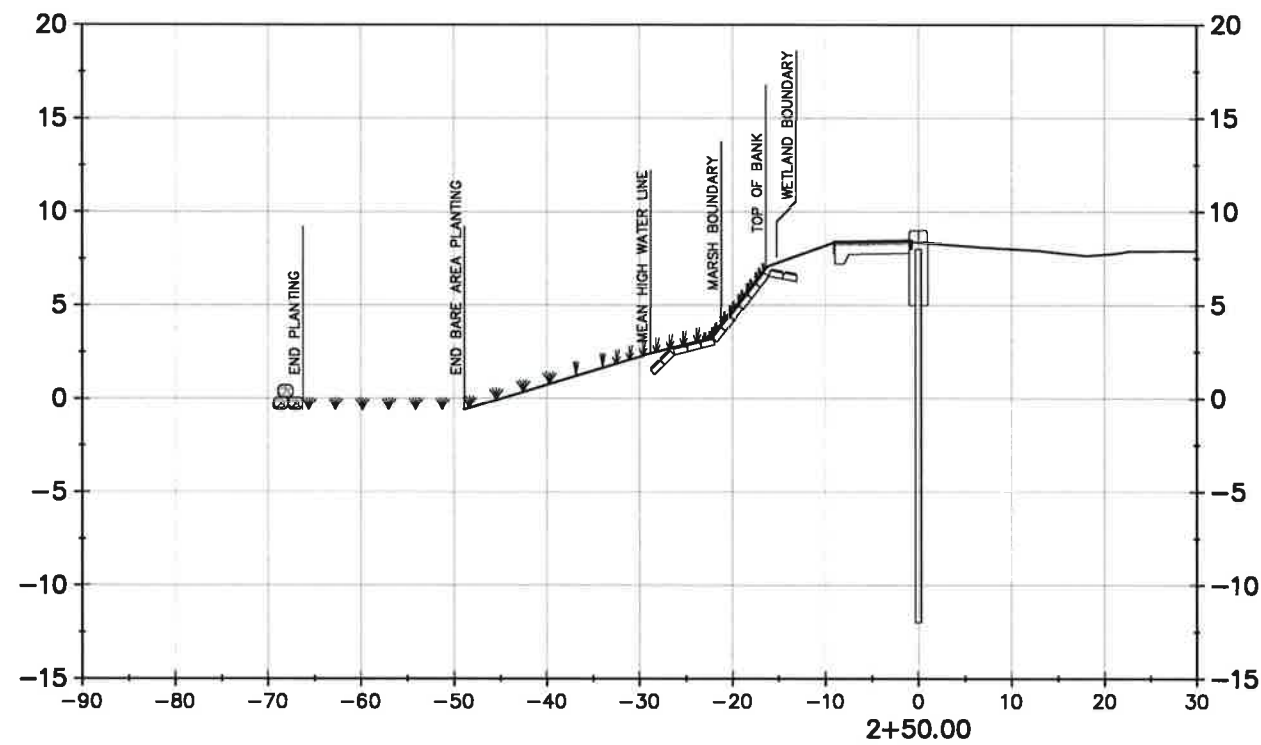
Amelia River Waterfront
Stabilization
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Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
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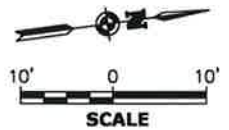
Drawing No.
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Date
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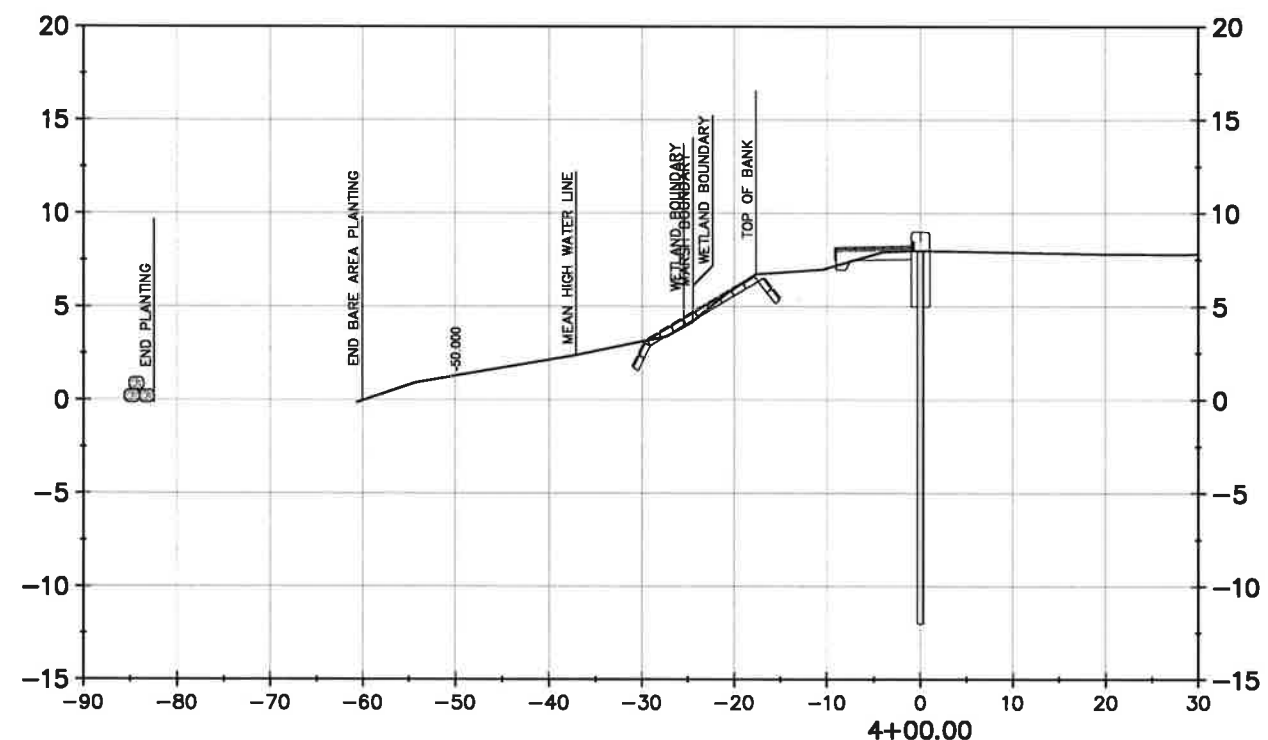
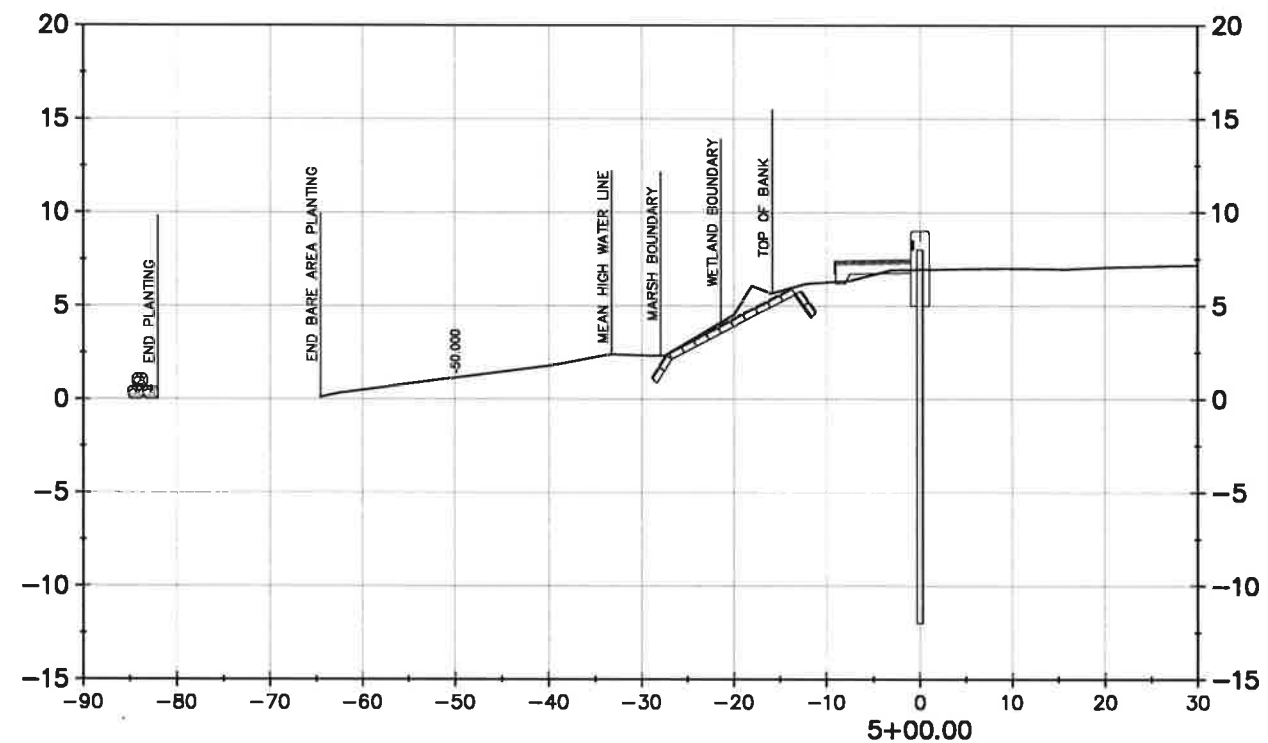
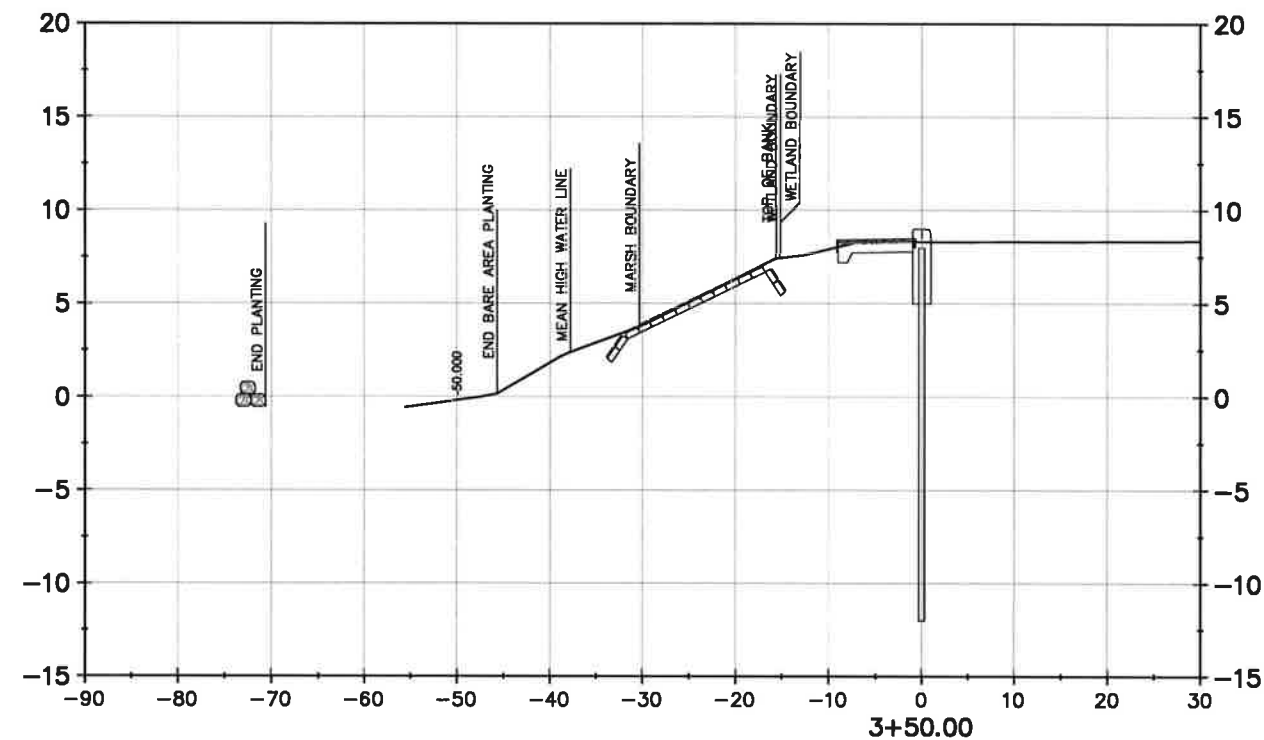
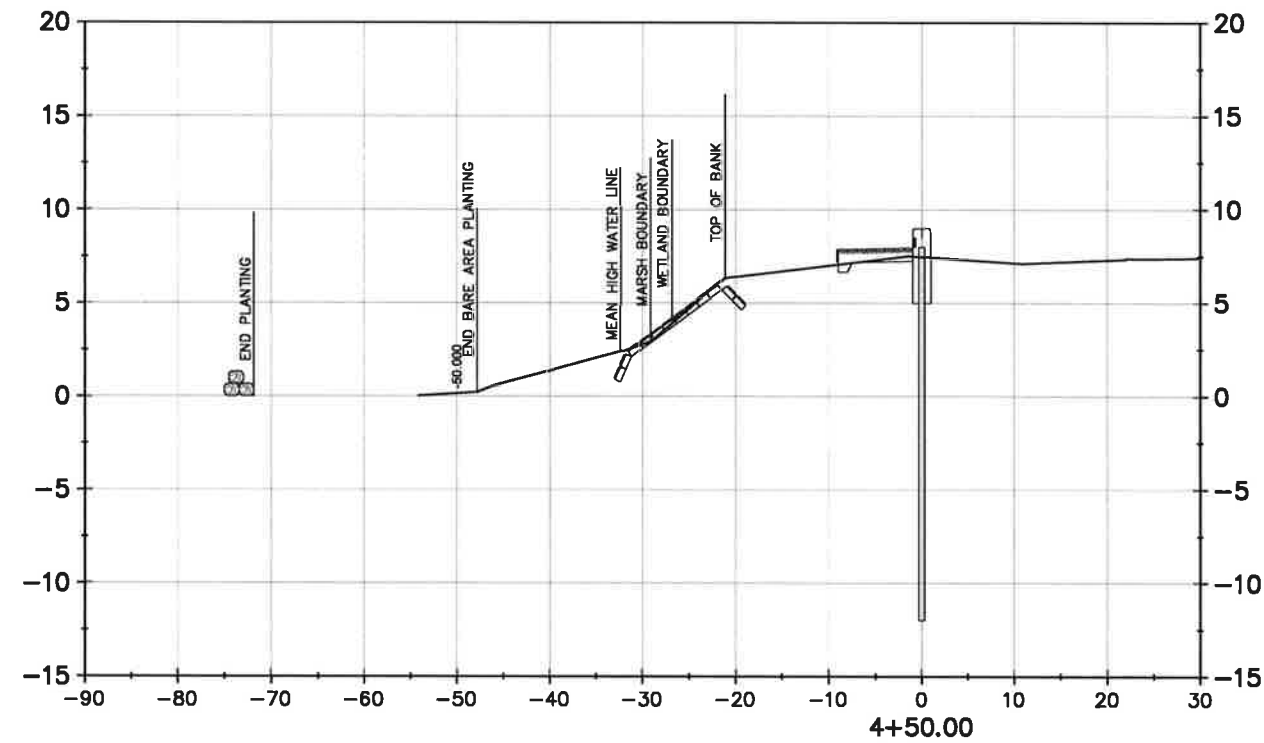
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County: Nassau State: Florida

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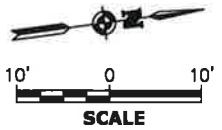
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Date
May 10, 2021

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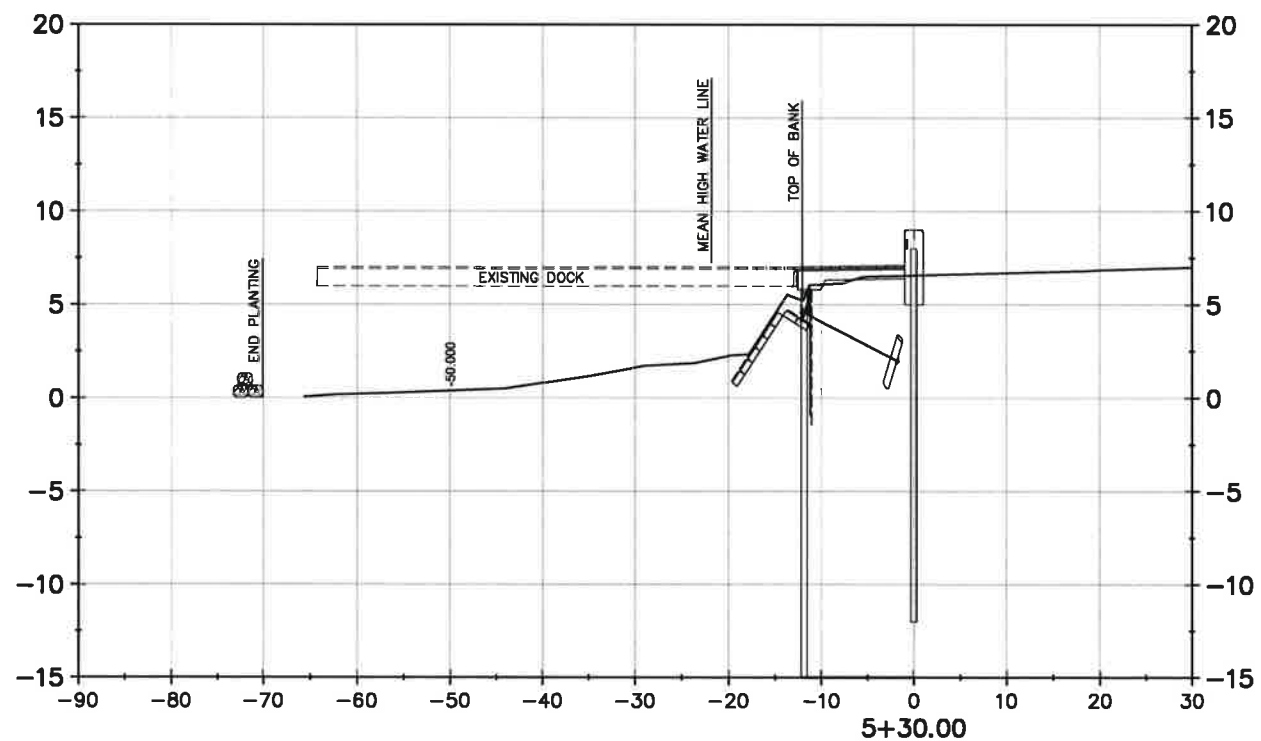
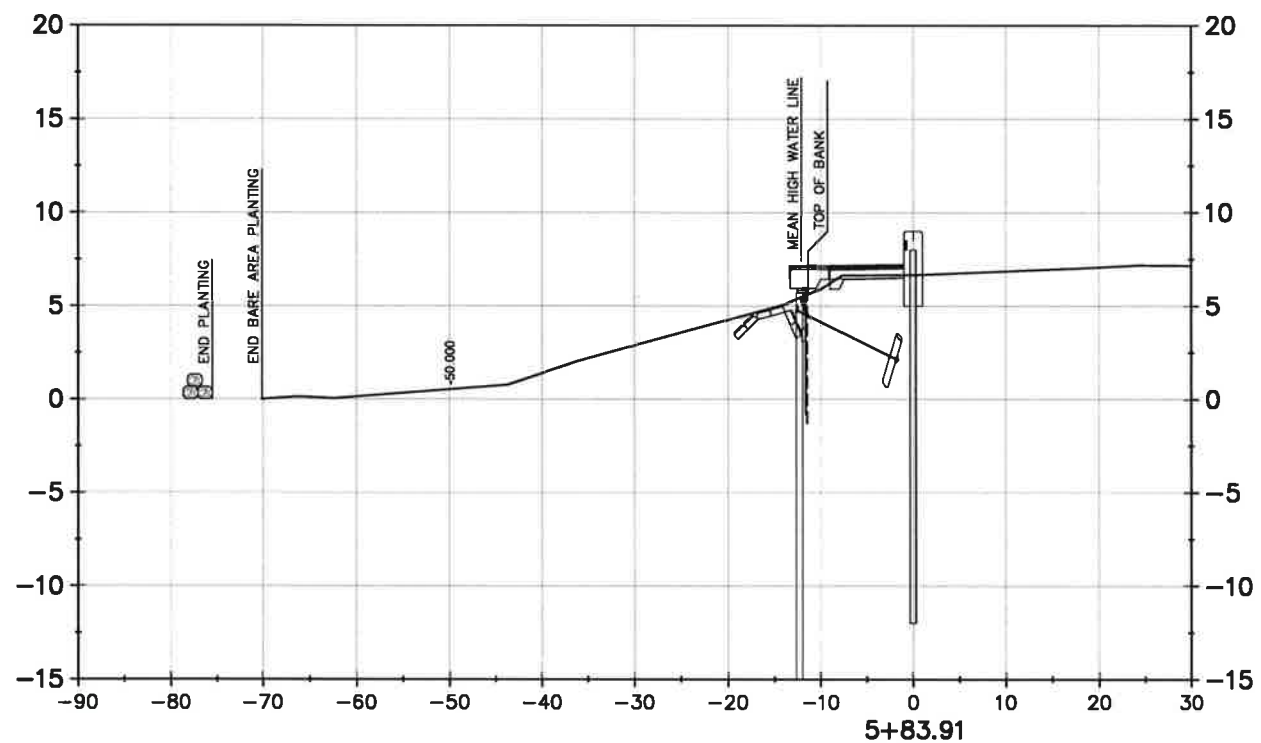
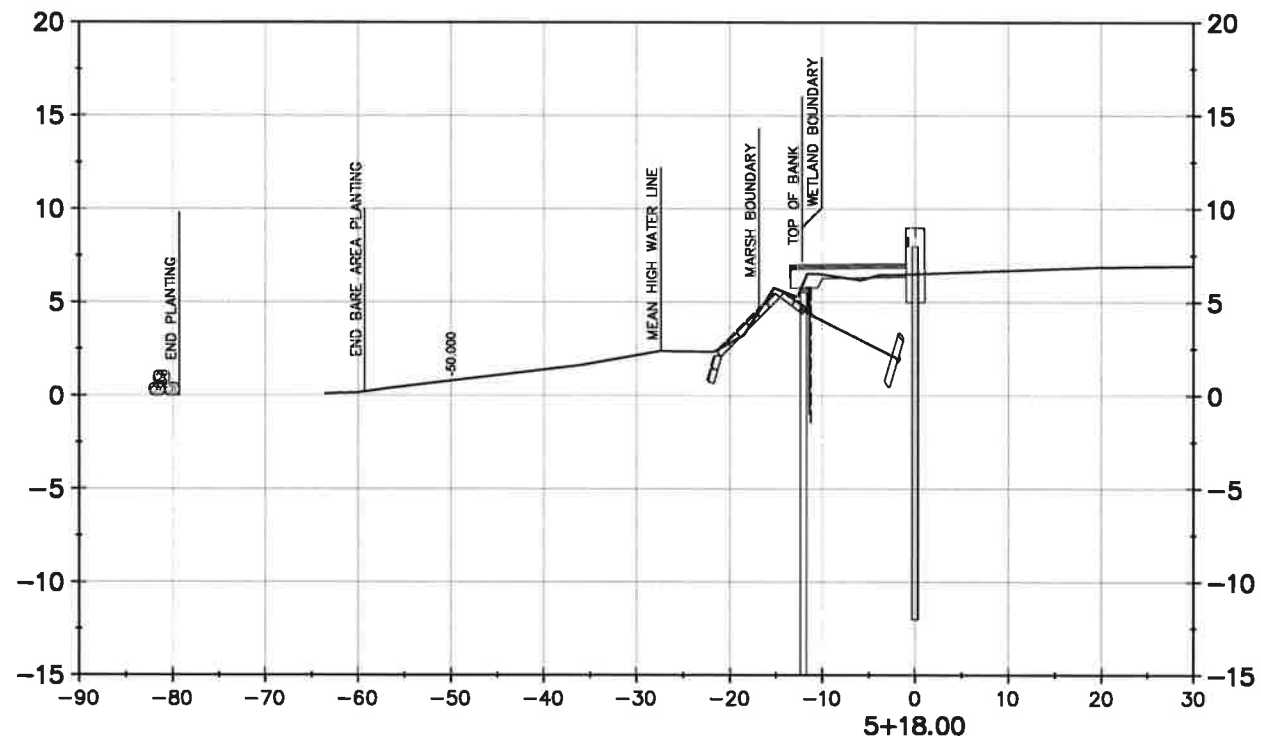
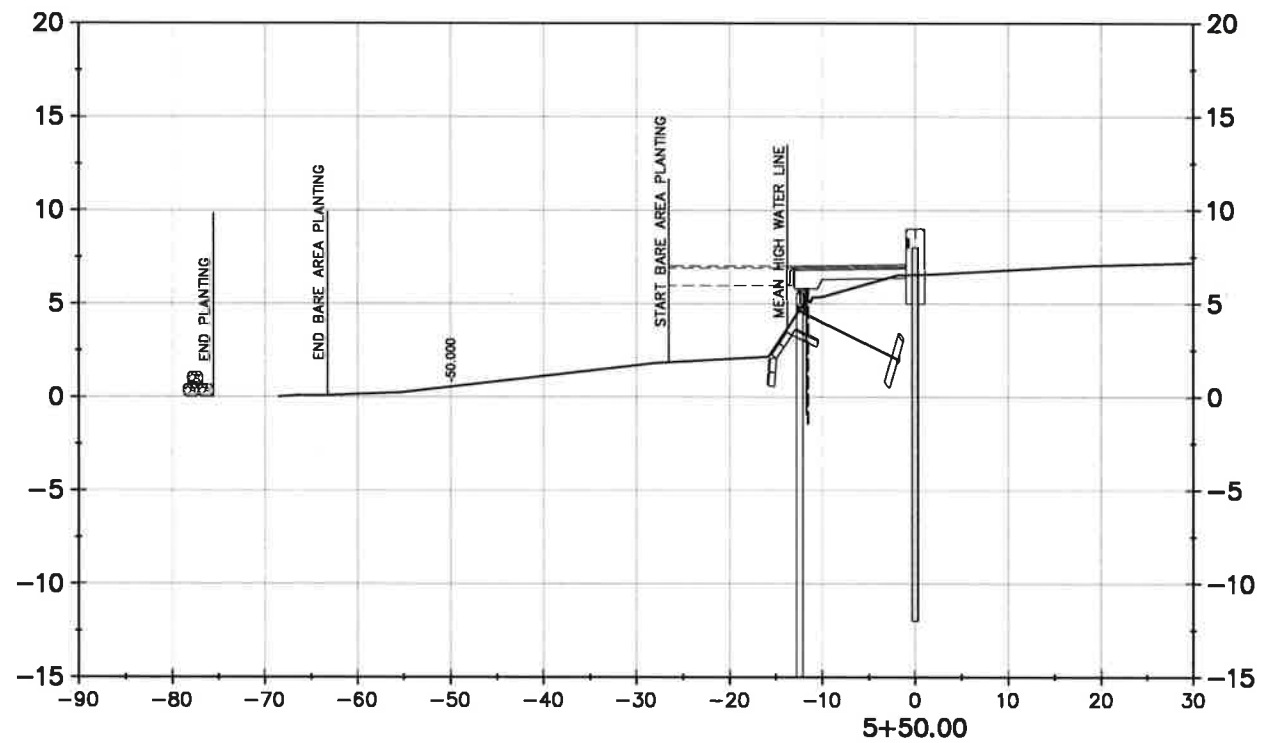
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

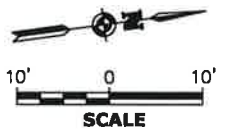
Drawing No.
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Date
May 10, 2021

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Fernandina Beach, Florida, 32034

Passero Associates
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Certificate of Authorization # 3428
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
Designed by Emily Bredestage

Revisions			
No.	Date	By	Description

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**CROSS
SECTIONS**

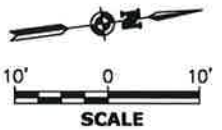
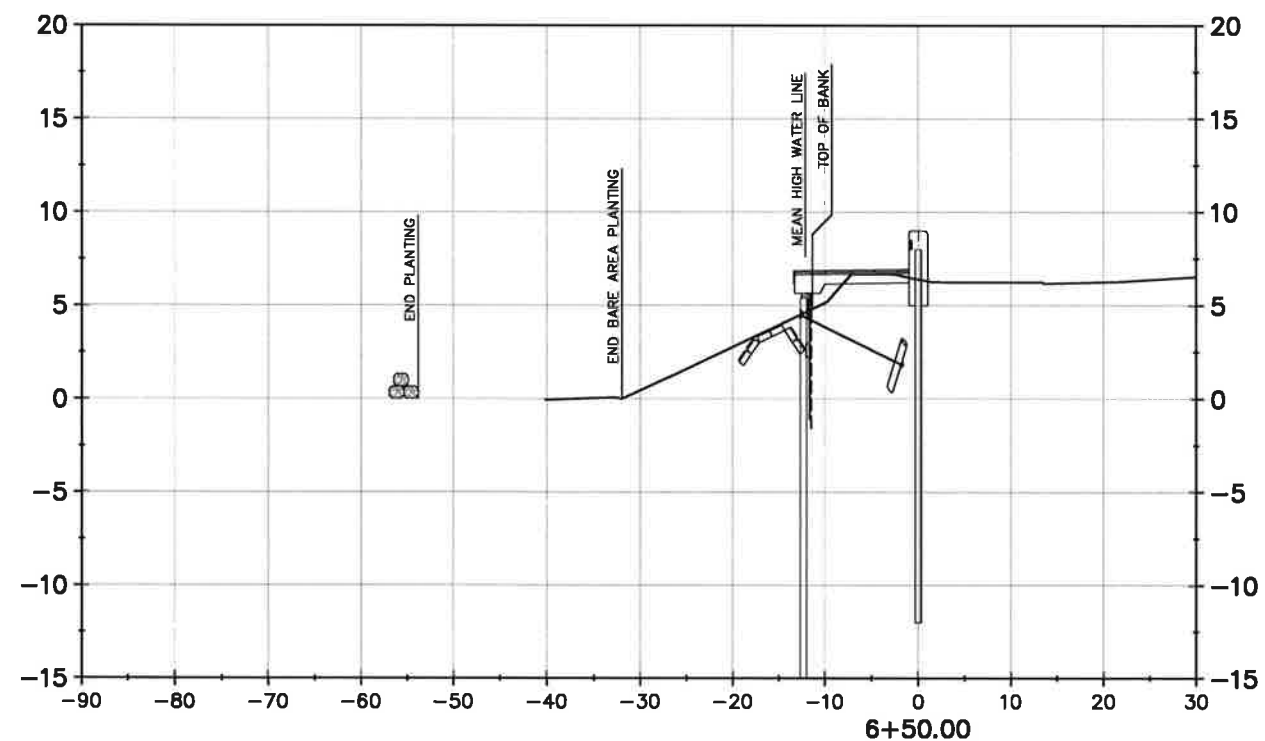
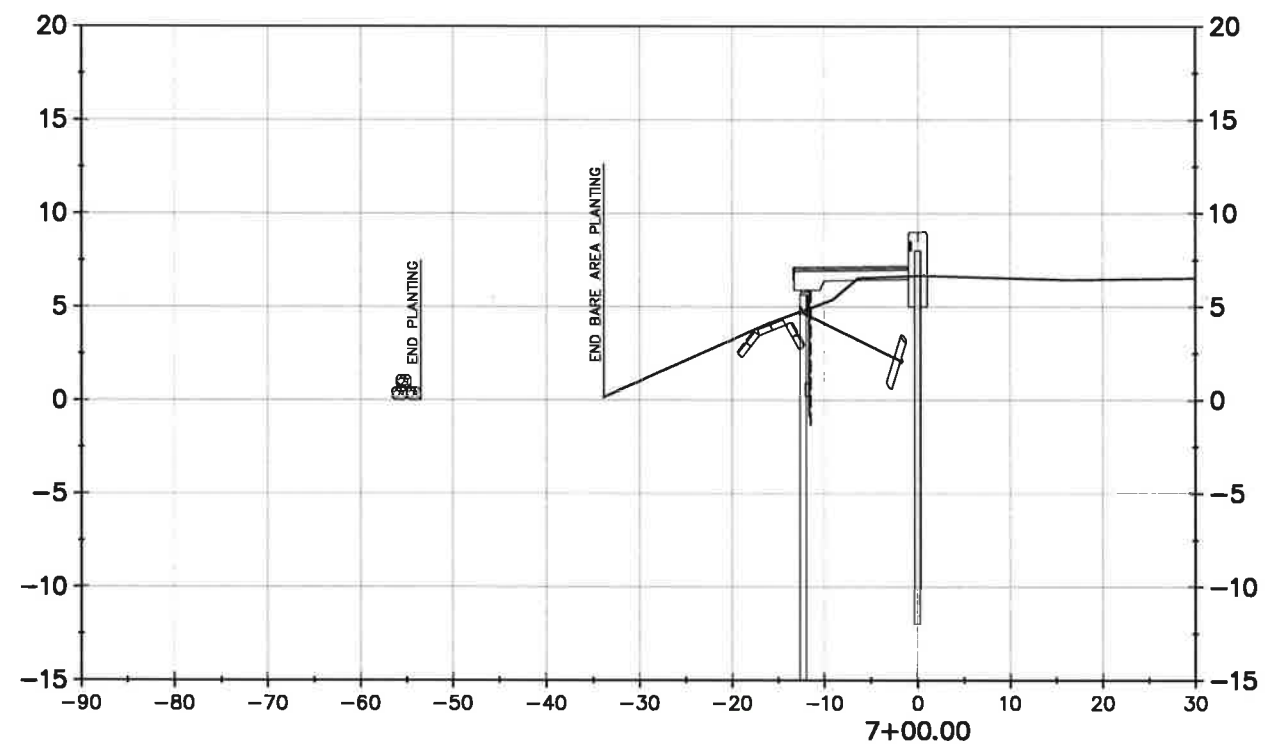
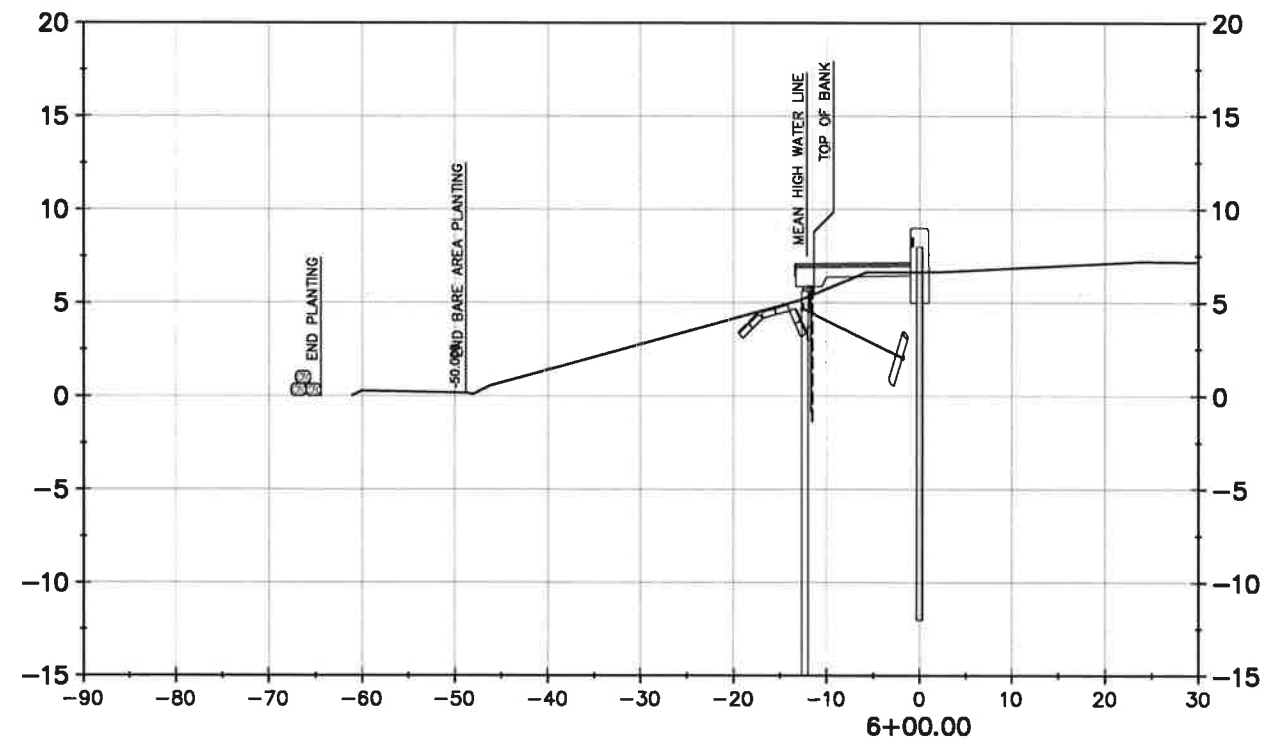
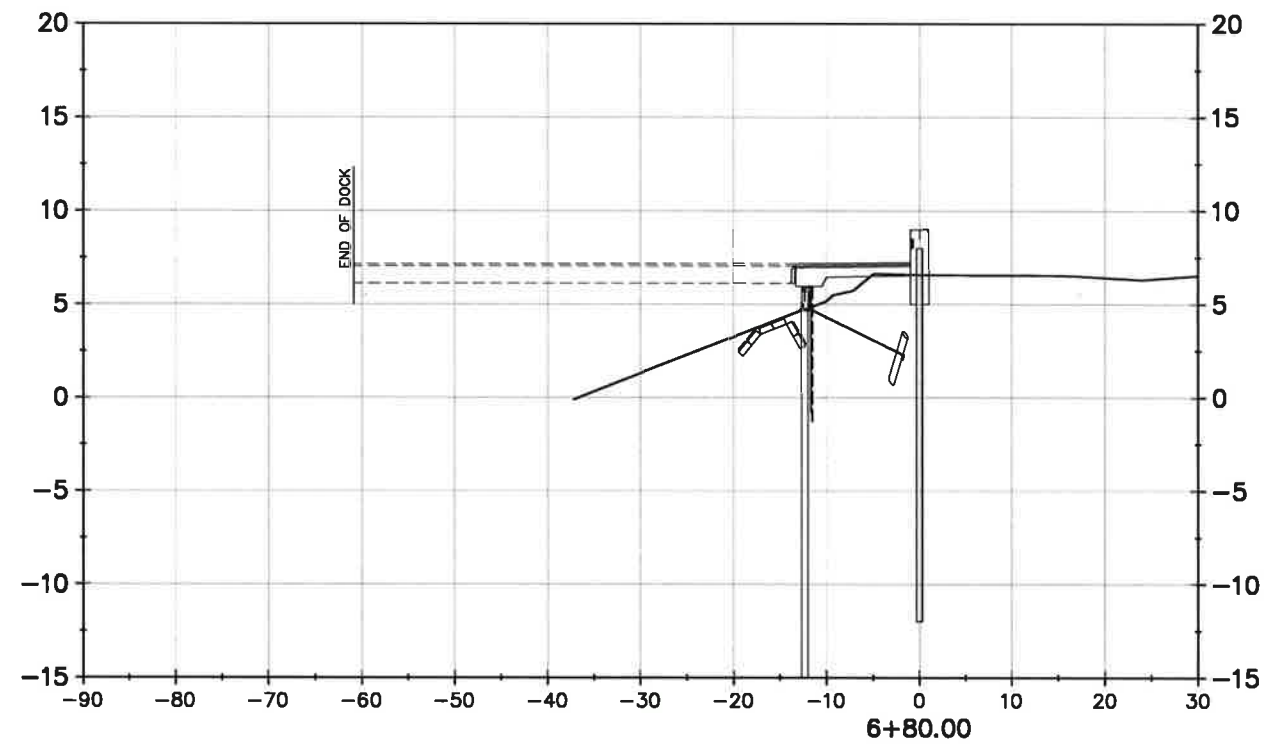
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C6-4

Date
May 10, 2021

Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\CS-01-PROF_XSCT.dwg CS-5_XSCT May 07, 2021 3:30pm by: EBredestegge



Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Cass Cole Way, Suite 200 (904) 757-6109
St. Augustine, FL 32095 Fax: (904) 757-6107
Principal-in-Charge: Christopher Nardone, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Bredestegge

Revisions			
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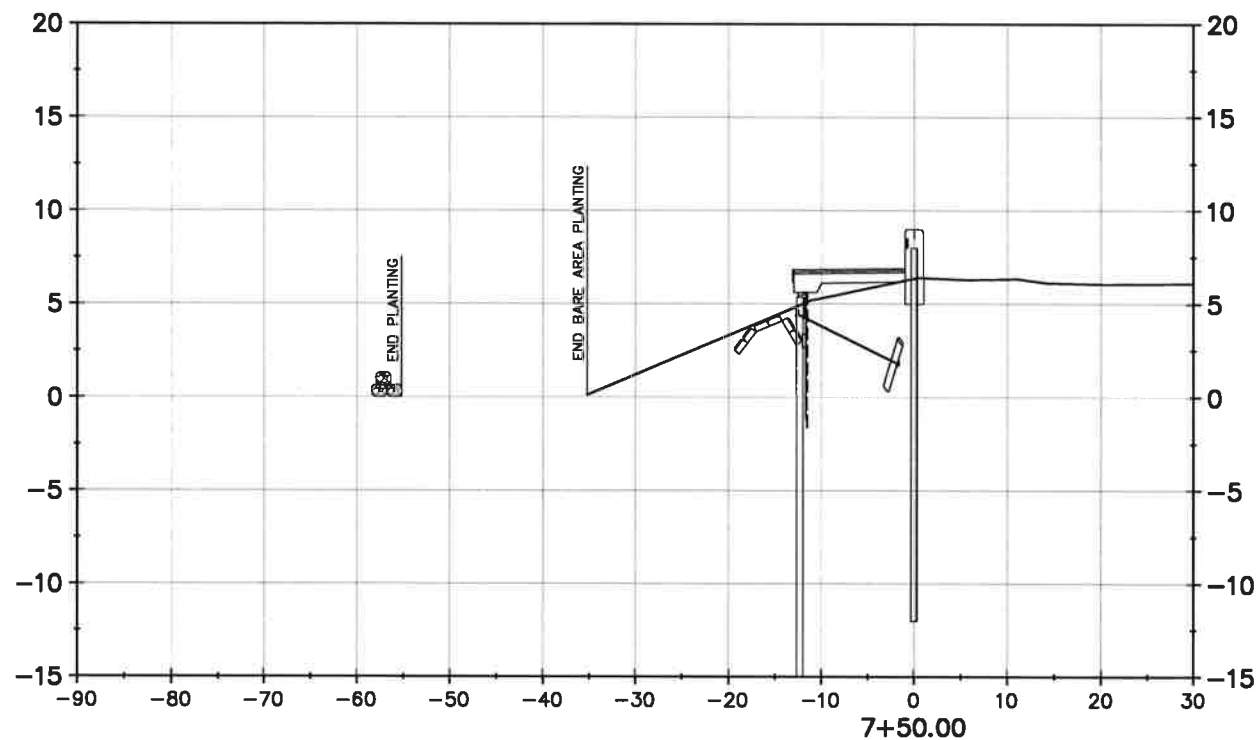
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

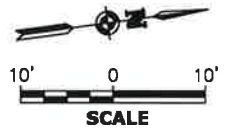
Drawing No.
C6-5

Date
May 10, 2021

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Fernandina Beach, Florida, 32034

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St. Augustine, FL 32055 Fax: (904) 757-6107
Certificate of Authorization # 3428
Principal-in-Charge Andrew M. Holesko, C.M.
Project Manager Christopher Nardone, AIA
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Revisions			
No.	Date	By	Description

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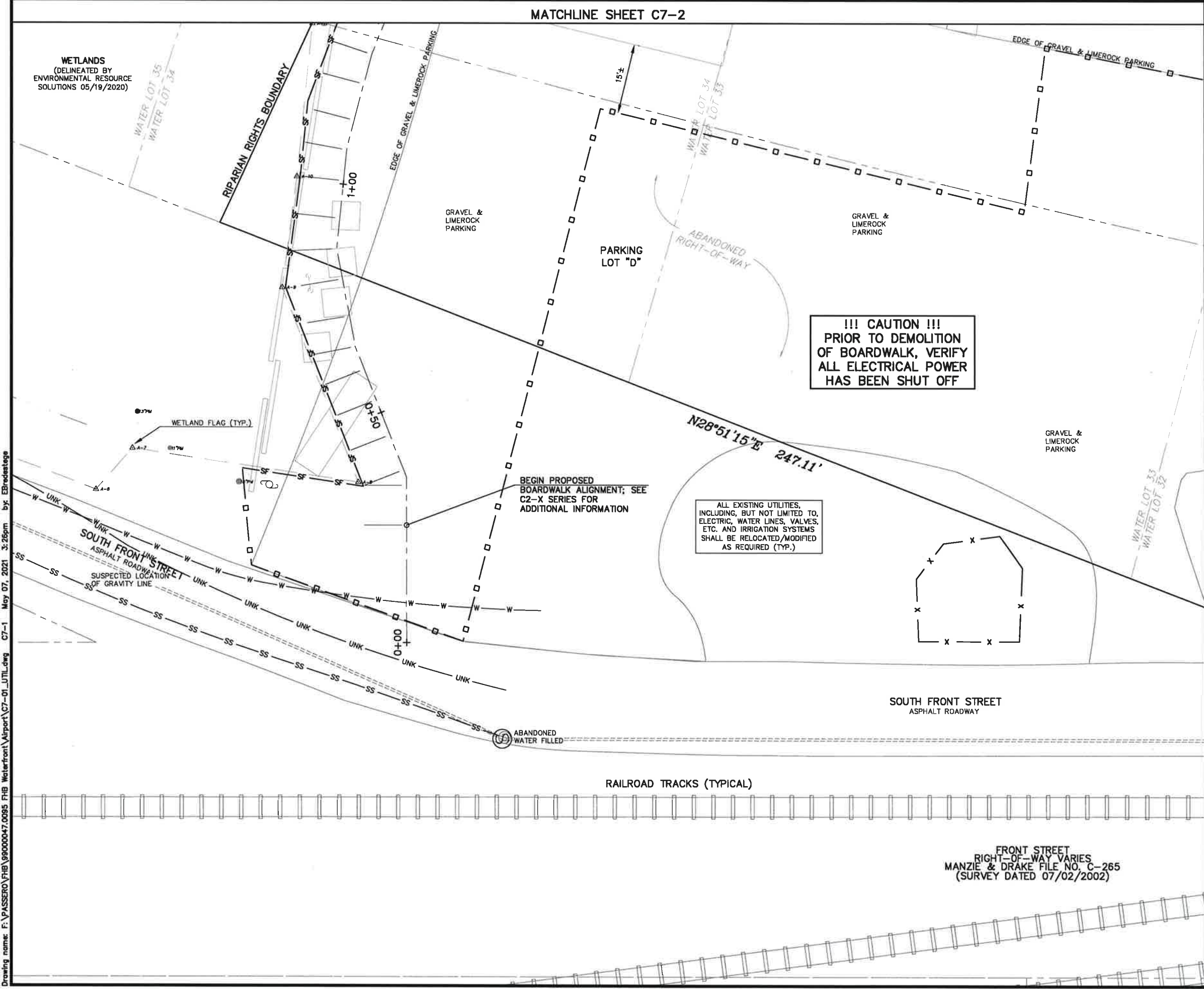
**CROSS
SECTIONS**

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

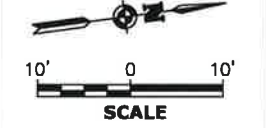
Drawing No.
C6-6

Date
May 10, 2021



Drawing name: F:\PASSERO\FHB\99000047.0095 FHB Waterfront\Airport\C7-01_UTL.dwg C7-1 May 07, 2021 3:25pm by: EBrdestage

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204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates
4730 Cass Circle West, Suite 200 St. Augustine, FL 32055 (904) 797-6106 Fax: (904) 797-6107
Certificate of Authorization # 3418
Principal-in-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Brdestage

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**EXISTING
UTILITY PLAN**

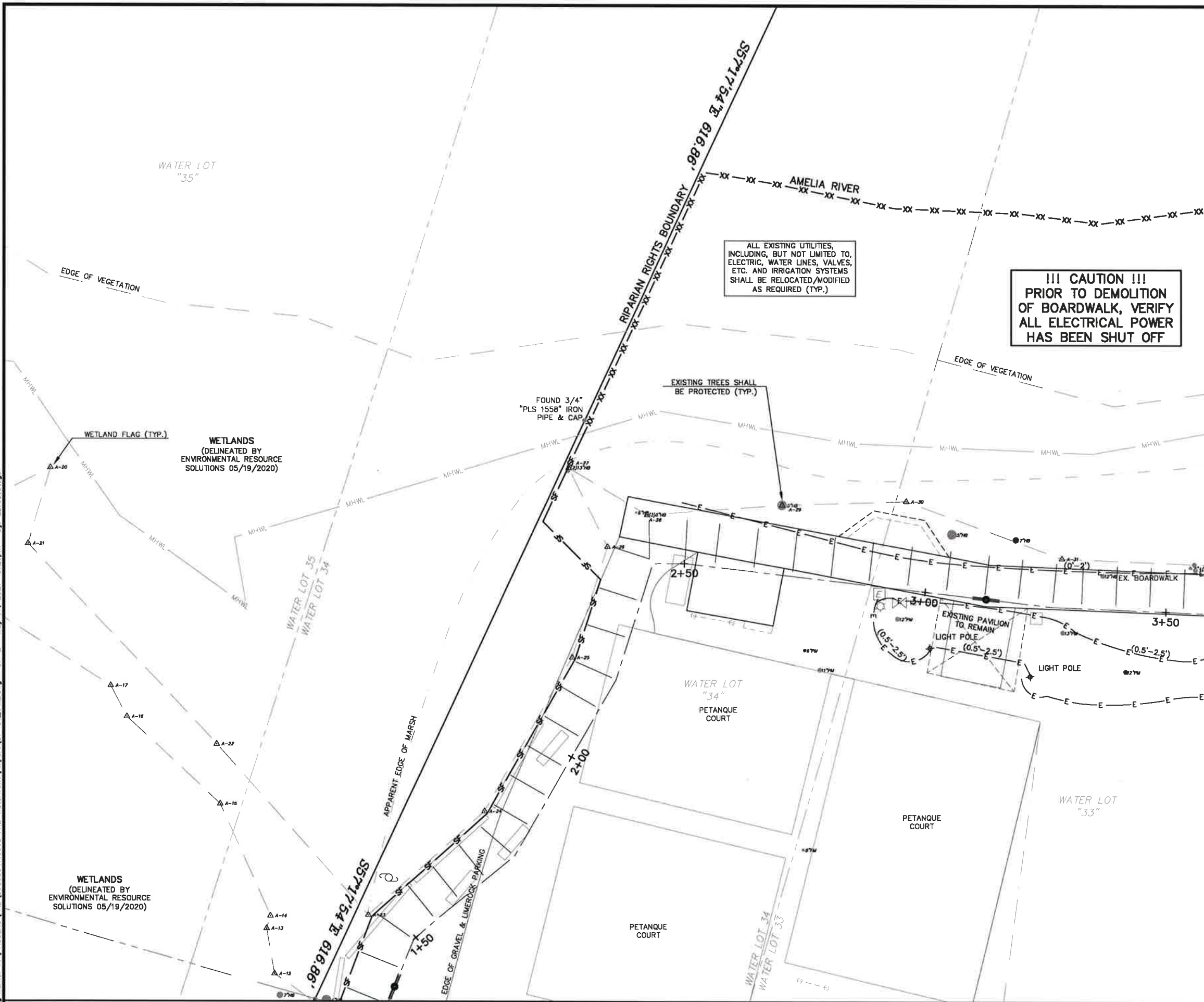
Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No:
99000047.0095

Drawing No:
C7-1

Date:
May 10, 2021

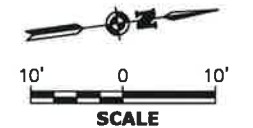
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ALL EXISTING UTILITIES, INCLUDING, BUT NOT LIMITED TO, ELECTRIC, WATER LINES, VALVES, ETC. AND IRRIGATION SYSTEMS SHALL BE RELOCATED/MODIFIED AS REQUIRED (TYP.)

!!! CAUTION !!!
PRIOR TO DEMOLITION OF BOARDWALK, VERIFY ALL ELECTRICAL POWER HAS BEEN SHUT OFF

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204 Ash St.
Fernandina Beach, Florida, 32034

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4730 Case Cole Way, Suite 200 (904) 757-6106
St. Augustine, FL 32095 Fax: (904) 757-6107
Certificate of Authorization # 3418
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Project Manager Christopher Nardone, AIA
Designed by Emily Bradestage

Revisions			
No.	Date	By	Description

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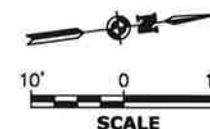
EXISTING UTILITY PLAN

Amelia River Waterfront Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C7-2

Date
May 10, 2021



Stamp:

Client:



City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

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Certificate of Authorization # 3428

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Project Manager Christopher Nardone, AIA
Designed by Emily Bredestegge

[illegible]

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EXISTING UTILITY PLAN

**Amelia River Waterfront
Stabilization
Parking Lots C & D**

Town/City: Fernandina Beach
County: Nassau State: Florida

Project No. 99000047.0095

Drawing No. **C7-3**

Date **May 10, 2021**

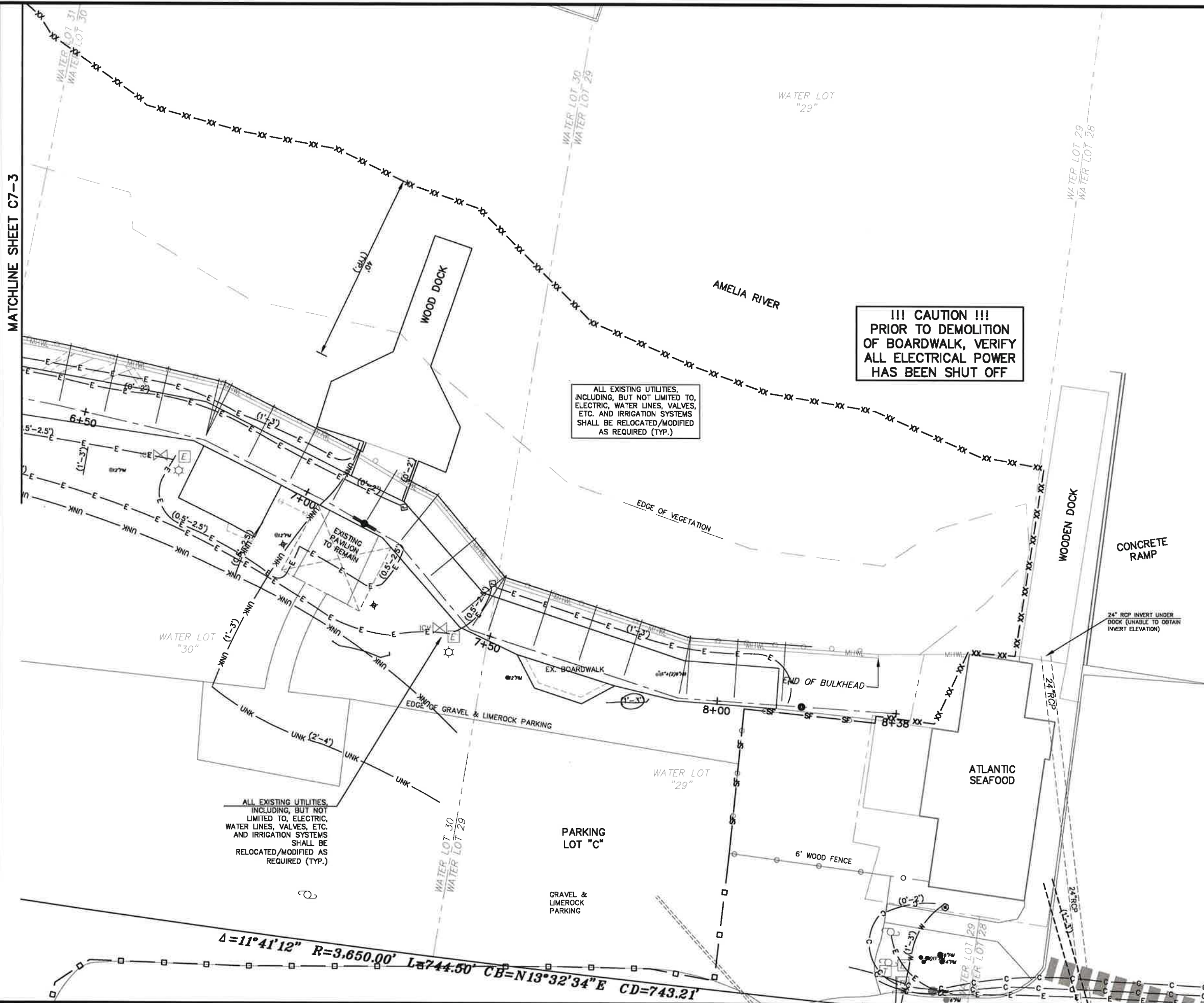
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MATCHLINE SHEET C7-2

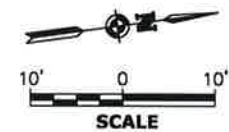
MATCHLINE SHEET C7-4

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MATCHLINE SHEET C7-3



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City of Fernandina Beach
204 Ash St.
Fernandina Beach, Florida, 32034

Passero Associates

4730 Galt Way, Suite 200
St. Augustine, FL 32085
Principal-in-Charge: Andrew M. Holesko, C.M.
Project Manager: Christopher Nardone, AIA
Designed by: Emily Brueste

Revisions

No.	Date	By	Description

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**EXISTING
UTILITY PLAN**

Amelia River Waterfront
Stabilization
Parking Lots C & D
Town/City: Fernandina Beach
County: Nassau State: Florida

Project No.
99000047.0095

Drawing No.
C7-4

Date
May 10, 2021