

Bridge & Seawall Infrastructure Review

Public Works – Engineering Division

February 3, 2020



CITY OF FORT LAUDERDALE

Bridge Infrastructure



Commission Priorities – Strategic Plan

Goal: Be a sustainable and resilient community.

Objective: Proactively maintain our water, wastewater, road, and bridge infrastructure.

Contractors/Support Agencies:

Engineering Control Systems, Corp.

Lambert Brothers, Inc.

Florida Department of Transportation

Transystems Corporation

Bridge Master Plan Overview



Overview

51 city-owned bridges

Bridge Master Plan completed August 2014

What is the Master Plan?

- Identifies Deficiencies
- Reviews Substandard Geometric Elements
- Functional Ability Rating
- Structural Rating
- Rehabilitation & Replacement Schedule

Bridge Master Plan Overview



What's in the Master Plan?

- Field Inspection Reports
- Bridge History
- Repair Options
- Cost Estimates
- Constructability Issues
- Long/Short Term Recommendation

Bridges Infrastructure



Issues and Challenges

- Salt and brackish water effect
- Tides and sea level rise
- Aging infrastructure
- Access during improvement

Opportunities

- Enhance level of service and reduce risk to traveling public
- Introduce new materials and processes

Bridges Infrastructure: Expenditures Overview



- \$11.5M Replacement Budget (5 Years)
- \$1M Annual Budget for Repair & Maintenance
- Average Maintenance Cost \$100K per Bridge includes:
 - Painting
 - Reinforcement
 - Spalling Repair

Bridges Infrastructure: Current FY 20 Projects



Construction:

- Coconut Isle Bridge
 - Construction Amount: \$1.4 Million
 - Estimated Completion Date: January 2021

Design:

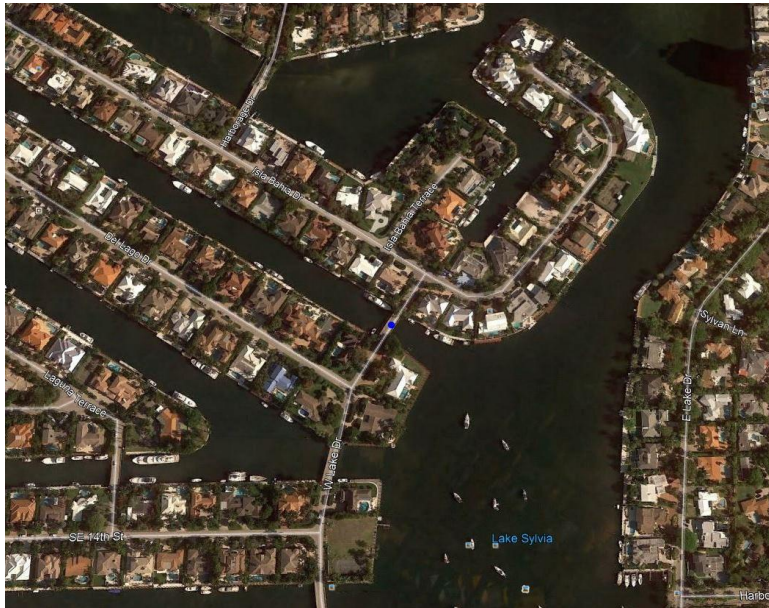
- South Ocean Drive
 - Cost Estimate: \$3.6 Million
- West Lake Drive Bridge
 - Cost Estimate: \$367,000

Planning:

- Bayview Drive Bridge
 - Cost Estimate: \$ TBD



Bridges Infrastructure: Scheduled for Maintenance



8 Locations:

- NE 1st Street Bridge
- Bayview Drive Bridge
- Bridge Mills Pond Canal
- NE 18th Avenue over Cypress Creek Canal
- NE 55th Street over Landing Inlet
- NE 15th Street over S. Fork Middle River
- Old Dixie Highway over S. Fork Middle River
- SE 9th Street over Tarpon River

Questions?



CITY OF FORT LAUDERDALE

Seawall Infrastructure

Public Works – Engineering Division



CITY OF FORT LAUDERDALE

Seawall Infrastructure

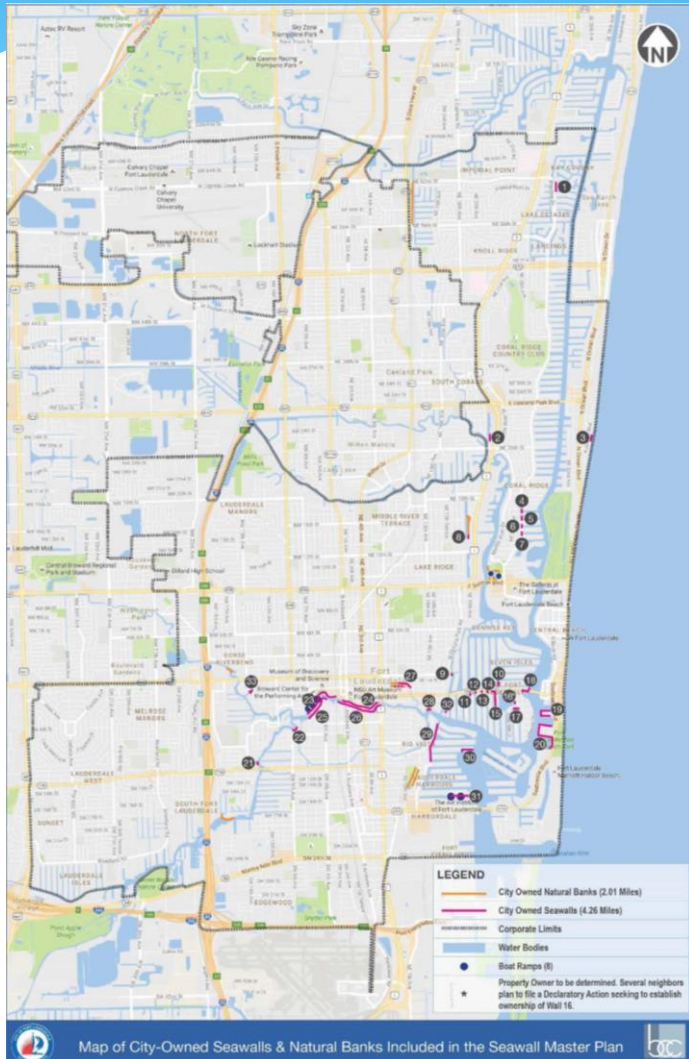


Commission Priorities – Strategic Plan

Goal: Be a sustainable and resilient community.

Objective: Proactively maintain our water, wastewater, road, and bridge infrastructure.

Seawall Assessment Study



- The seawall assessment study was performed by BCC Engineering, Inc.
- The assessment consisted of 35 (4.41 miles) of city owned seawalls.
- The final report was completed on February 5, 2018.
- The assessment consisted of limited visual inspections, prioritization of seawalls for replacement/repair and general cost estimates for the repairs.

Seawall Masterplan Assessment



TABLE 2.5 – WALL VULNERABILITY* (Reference Figure 1 for seawall locations)

Wall	When Overtopped	Raising Required	When Addressed**	Funds Encumbered	Requiring Funding	Comments	Common Name
1	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. 0-5 Yr overtopping, deficiencies, portions failing.	Bayview Dr. at Bay Colony
2	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. 0-5 Yr overtopping, deficiencies, majority has failed.	Budget Inn Property
3	N/A	N/A	6-10 Yr	6-10 Yr	6-10 Yr	Deficiencies and exposure (beach) warrant 6-10 Yr replacement.	Loggerhead Park
4	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Deficiencies warrant 6-10 Yr replacement.	Bayview Dr. north of NE 17th St.
5	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Deficiencies warrant 6-10 Yr replacement.	Bayview Dr. north of NE 16th St.
6	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Deficiencies warrant 6-10 Yr replacement.	Bayview Dr. north of NE 15th St.
7	16-20 Yr	11-15 Yr	6-10 Yr	6-10 Yr	6-10 Yr	Deficiencies warrant 6-10 Yr replacement.	Bayview Dr. north of NE 14th St.
8	2036+	2036+	6-10 Yr	6-10 Yr	6-10 Yr	Deficiencies warrant 6-10 Yr replacement.	Lake Melva north of Ford Dealer
9	0-5 Yr	0-5 Yr	11-15 Yr	11-15 Yr	11-15 Yr	Lower risk location. Projected as overtopping, but no record of overtopping.	Victoria Park
10	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. Deficiencies and high-profile location.	Seven Isles Dr. at Del Mar Pl.
11	16-20 Yr	11-15 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. Deficiencies govern when wall is addressed.	City Pump Station
12	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	High priority. High profile location along critical east-west roadway.	E. Las Olas Blvd. east of Lido Dr.
13	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	High priority. High profile location along critical east-west roadway.	E. Las Olas Blvd. east of San Marco Dr.
14	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	High priority. High profile location along critical east-west roadway.	E. Las Olas Blvd. east of Coral W.
15	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. Currently overtopping. High profile location.	Isle of Palms Dr.
16	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. Currently overtopping. High profile location.	SE 25th Ave.
17	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	Mid-priority. Not currently overtopping. Available funds may bump to 0-5 Yr.	SE 5th St.
18	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. Condition and high profile location along Las Olas Blvd.	E. Las Olas at ICWW
19	16-20 Yr	16-20 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Deficiencies warrant 0-5 Yr repair prior to raising 16-20 Yr.	Swimming Hall of Fame
20	11-15 Yr	11-15 Yr	11-15 Yr	11-15 Yr	11-15 Yr	Lower priority. Good condition and overtopping 11-15 Yr.	Bahia Mar
21	6-10 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	0-5 Yr overtopping but no overtopping noted. Low risk (park) location.	Coontie Hatchie Landings Park
22	11-15 Yr	6-10 Yr	6-10 Yr	6-10 Yr	6-10 Yr	Minor 6-10 Yr overtopping. Low risk (park) location. Recently rehabilitated.	Lewis Landing Park
23	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Partial repair/raising.	Riverwalk North west of CSX
24	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Partial repair/raising.	Riverwalk North east of CSX
25	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Partial repair/raising.	SW 5th Ave.
26	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Partial repair/raising.	Riverwalk South
27	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Currently overtops.	Richard Mancuso Greenway
28	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Partial repair/raising.	Colee Hammock Park
29	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Top priority. Currently overtopping and structural deficiencies. High profile.	Cordova Rd.
30	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Currently overtops. High profile.	SE 10th St.
31	0-5 Yr	0-5 Yr	6-10 Yr	6-10 Yr	6-10 Yr	No record of currently overtopping. Replace 6-10 Yr.	Cox's Landing Boat Launch
32	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	Currently overtopping. High profile.	Mola Ave.
33	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	No record of currently overtopping, however survey indicates overtopping.	Sailboat Bend Preserve
34	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	No record of overtopping. Survey indicates overtopping. High profile location.	Barcelona Dr. East of NE 26th Terrace
35	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	0-5 Yr	No record of overtopping. Survey indicates overtopping. High profile location.	SE 8th St.

Priority

Construction

Construction
Priority

*Timeframes are based on Work Program Windows in absence of detailed Vulnerability Analysis and uncertainties/variations in SLR projections.

**Wall Vulnerability (overtopping) may not govern when wall is addressed. See "Comments" for clarification.



Current Seawall Projects

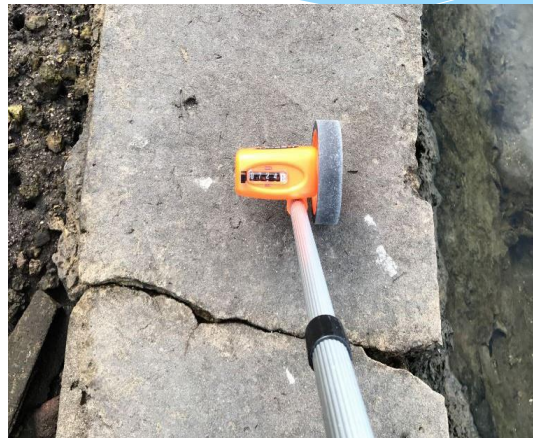
1. Isle of Palms Seawall Replacement
2. Cordova Road Seawall Replacement



Existing Isle of Palms Seawall: Structural Condition



- **Constructed of:**
Coral rock seawall
- **Construction Date:**
Unknown
- **Average Cap Elevation:**
1.26' NAVD
- **Condition:**
Poor with significant horizontal and vertical displacement with loss of fill from behind the wall
- **2016 Seawall Assessment Masterplan Recommendation:**
Replacement and Raising within 0-5 years



Isle of Palms Seawall: Current Top of Wall Elevation



- **Current Average Cap Elevation:**
1.26' NAVD
- Typical King Tide elevations range between 1.5' to 2.5' NAVD and are projected to increase.

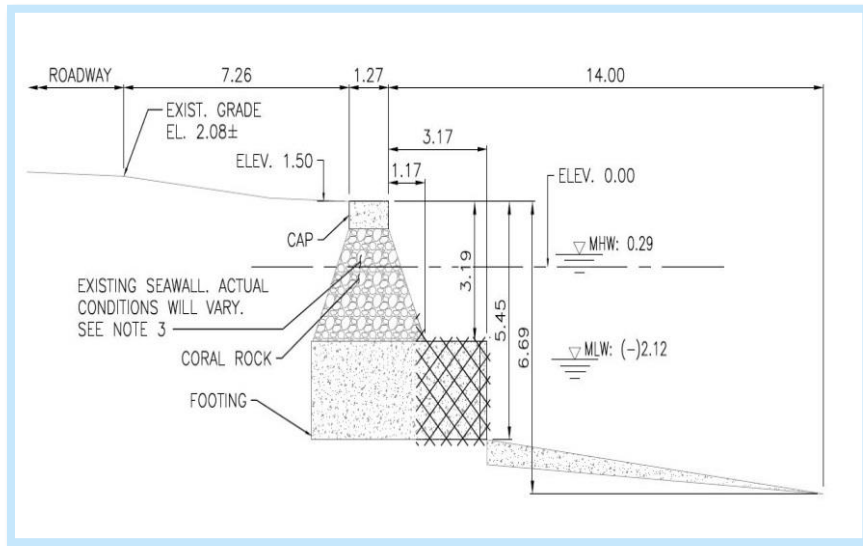


Today (9/30/19, 10:30 am), 2.10' NAVD

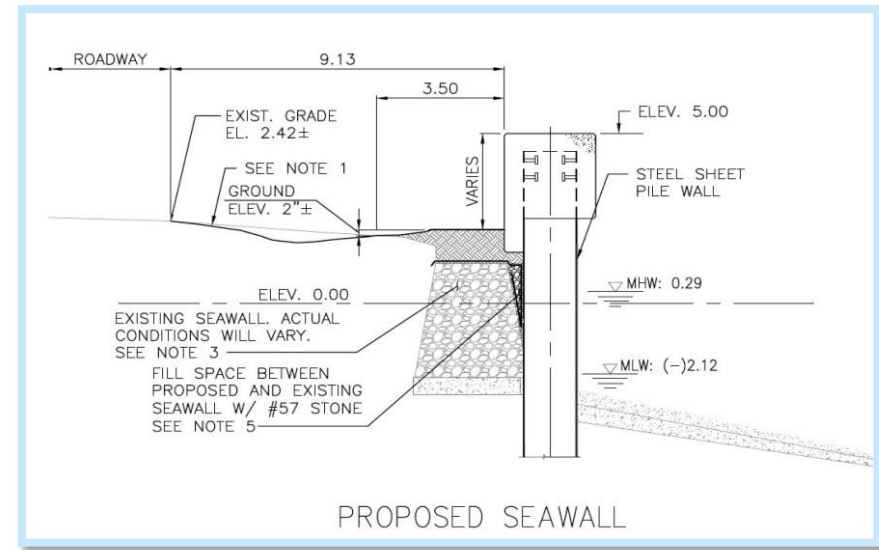
Typical Cross-Section



Existing



Proposed



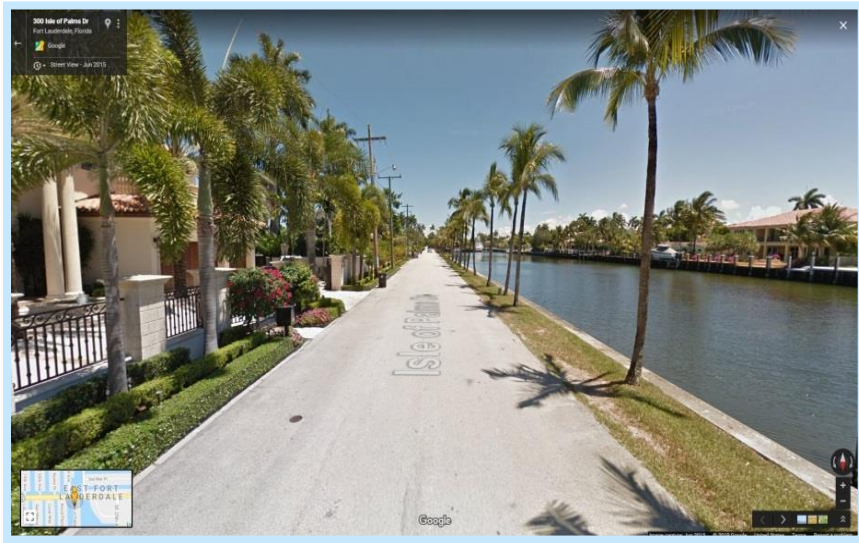
Looking South

Isle of Palms Drive Preview



Existing

Proposed

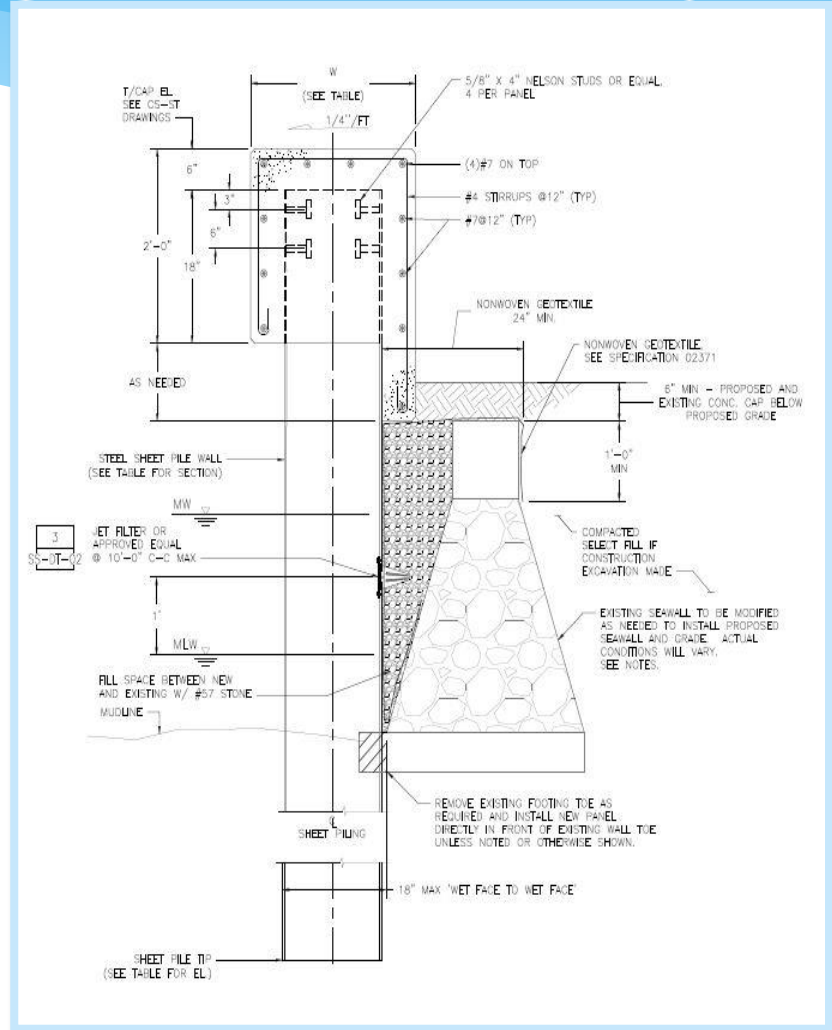


Looking South

Construction Specifications



- **Seawall elevation** (top of concrete cap)
 - 5.0' NAVD
 - Approximately 3.5 feet higher than existing seawall
 - NAVD – datum used to determine base flood elevations
- **Steel sheet pile**
 - 28 feet in length
 - Coated for protection against corrosion
 - Urethane zinc primer
 - Polyamine epoxy
- **Concrete cap**
 - 26 in wide x 24 in height
 - Will look like a concrete wall from roadside



Benefits to Neighbors



- Reduced frequency, intensity and duration of tidal flooding on Isle of Palms Drive
 - Protect adjacent properties from storm surge
 - Improved traffic
 - Safer access to Isle of Palms neighborhood
- Improved local right-of-way drainage
- New roadway surface (driving) course
- Help maintain property value
- Protect existing infrastructure by replacing deteriorated seawall
- Swale width to increase by a minimum of 1.5 feet
 - New sod and landscape will be installed

Impacts During Construction



- **Traffic**
 - Expect west (southbound lane) to be closed
 - Flaggers will direct traffic
- **Noise and vibration**
 - Sheet pile driving
 - Contractor will monitor noise and vibration to comply with contract specifications
 - City will retain independent vibration and noise monitoring services
 - Concrete trucks, materials deliveries, paving equipment

Tentative Schedule



- **November 5, 2019:** Contract award by City Commission
- **Mid December, 2019:** Contract to be fully executed
- **Early to mid January 2020:** Notice to Proceed (NTP) for Construction
- **Late September 2020:** Construction fully completed

Project Website



- Frequently Asked Questions (FAQ) Document
- Project Flyers, Presentations
- General Information About Project Milestones
- URL: <https://www.fortlauderdale.gov/departments/public-works/engineering/isle-of-palms-seawall-3838>

Current Seawall Projects

1. Isle of Palms Seawall Replacement
2. Cordova Road Seawall Replacement



Cordova Road Seawall: Scope of Work



- Repair/replace 2,200 linear feet of existing City-owned seawall
- Construct upland local drainage improvements benefitting the Cordova Road public right-of-way
- Mill and resurface the existing roadway
- Fully restore project job site

Cordova Road Seawall: Construction Schedule



- **February 2019:** Permitting
- **January 2019 – July 2019:** Bidding & Contract award
- **October 2019:** Construction Purchase Order Issued to Custom Built Marine Construction
- **October 2019:** Construction commences
- **October 2020:** Estimated twelve (12) month construction schedule for project completion.



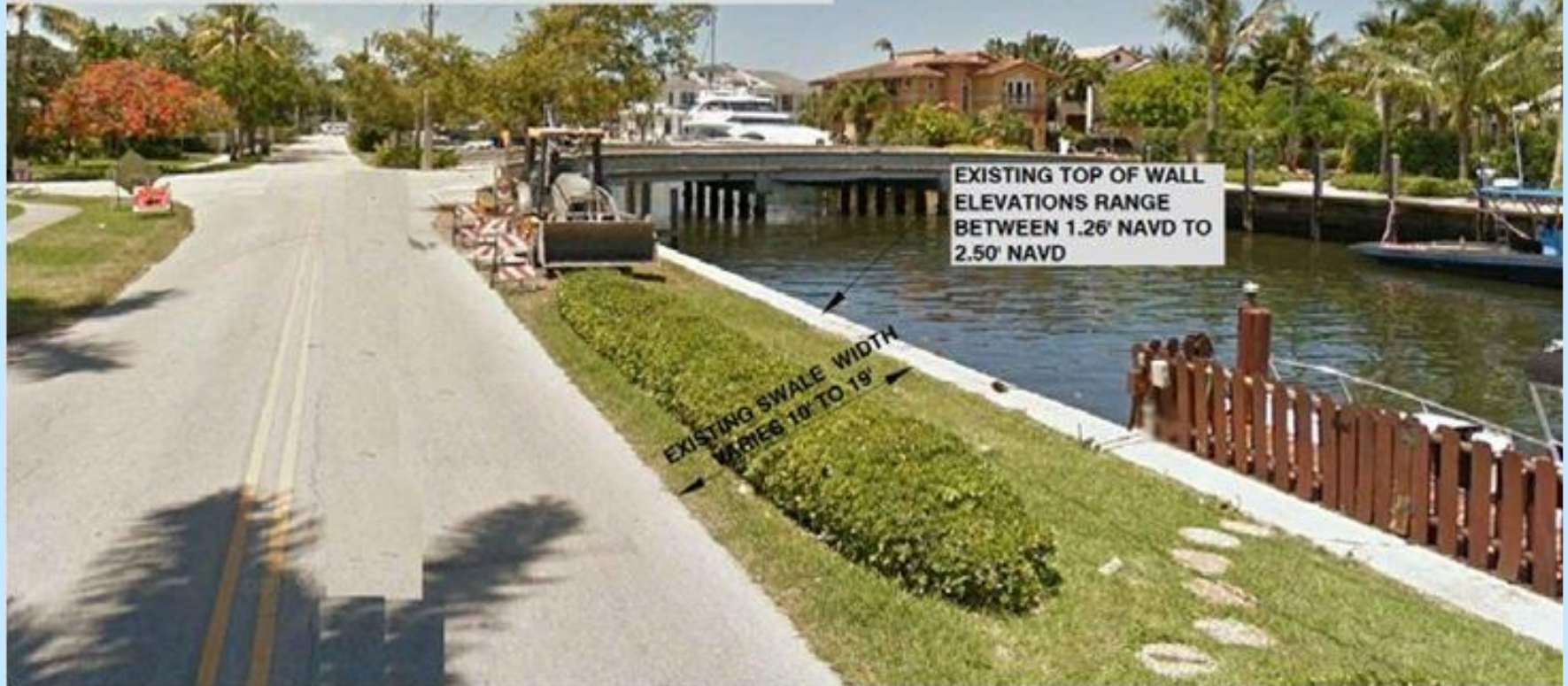
Pre-development Condition



Pre-development Condition



**PRE DEVELOPMENT TYPICAL CROSS-SECTION
CORDOVA ROAD LOOKING NORTH**



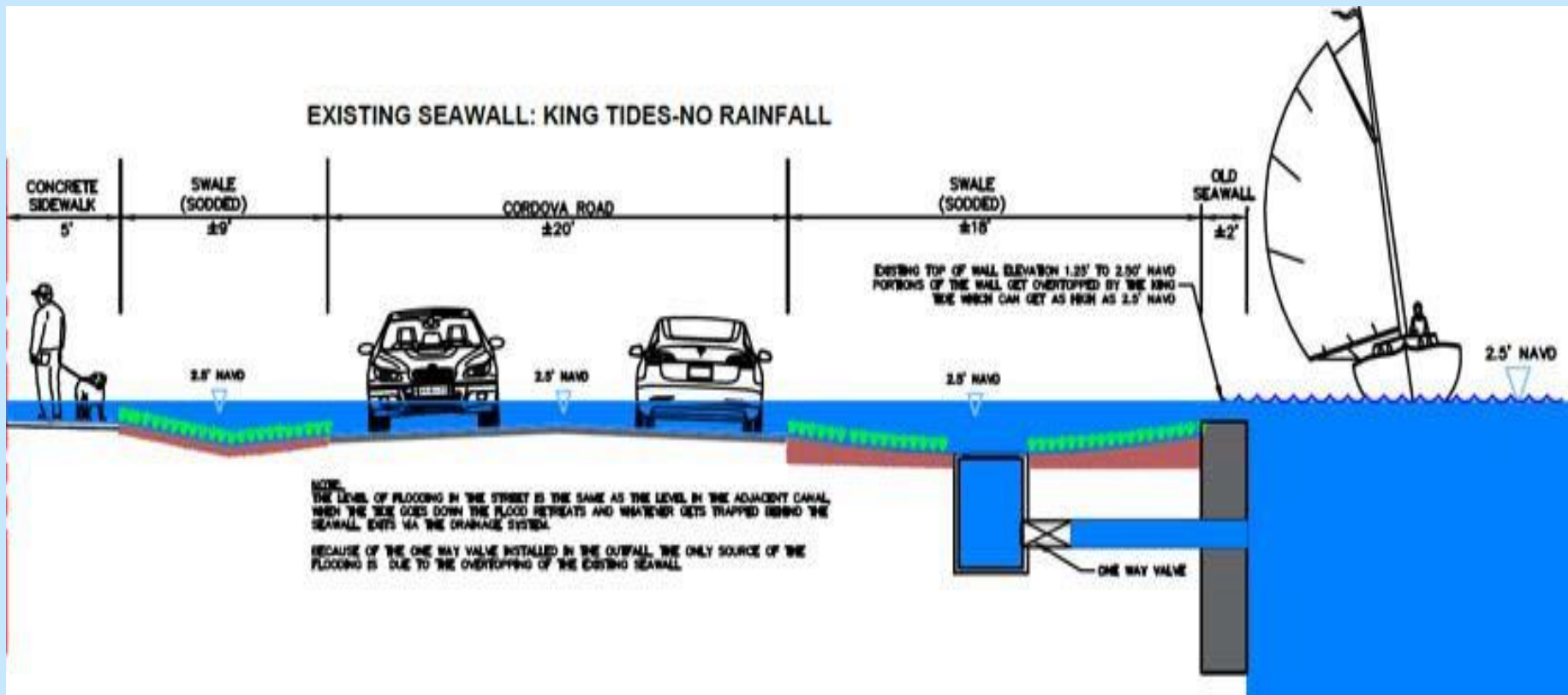
EXISTING TOP OF WALL
ELEVATIONS RANGE
BETWEEN 1.26' NAVD TO
2.50' NAVD

EXISTING SWALE WIDTH
VARIES 10' TO 19'

Pre-development Condition



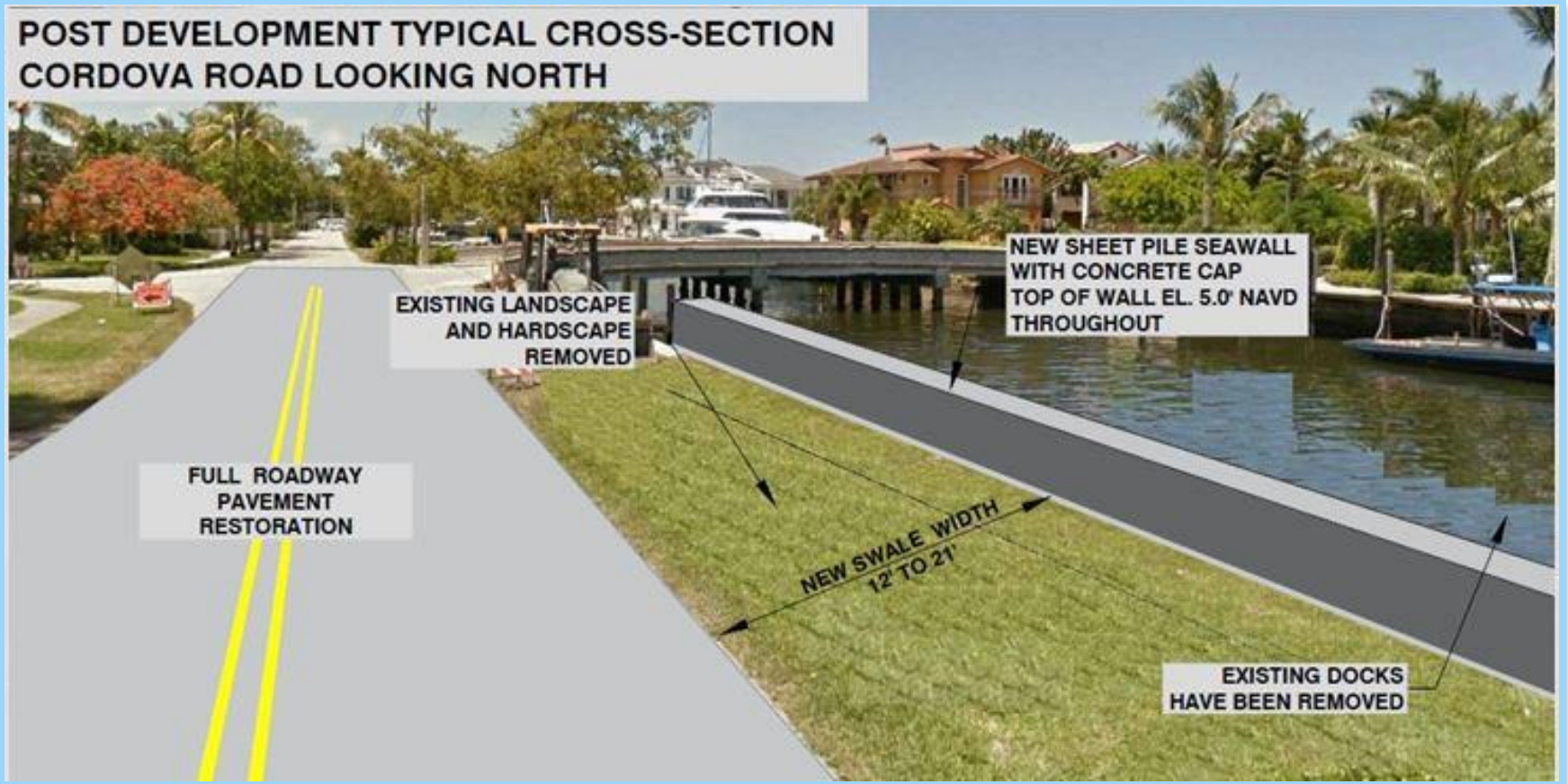
EXISTING SEAWALL: KING TIDES-NO RAINFALL



Post Development Condition



POST DEVELOPMENT TYPICAL CROSS-SECTION CORDOVA ROAD LOOKING NORTH



FULL ROADWAY
PAVEMENT
RESTORATION

EXISTING LANDSCAPE
AND HARDSCAPE
REMOVED

NEW SWALE WIDTH
12' TO 21'

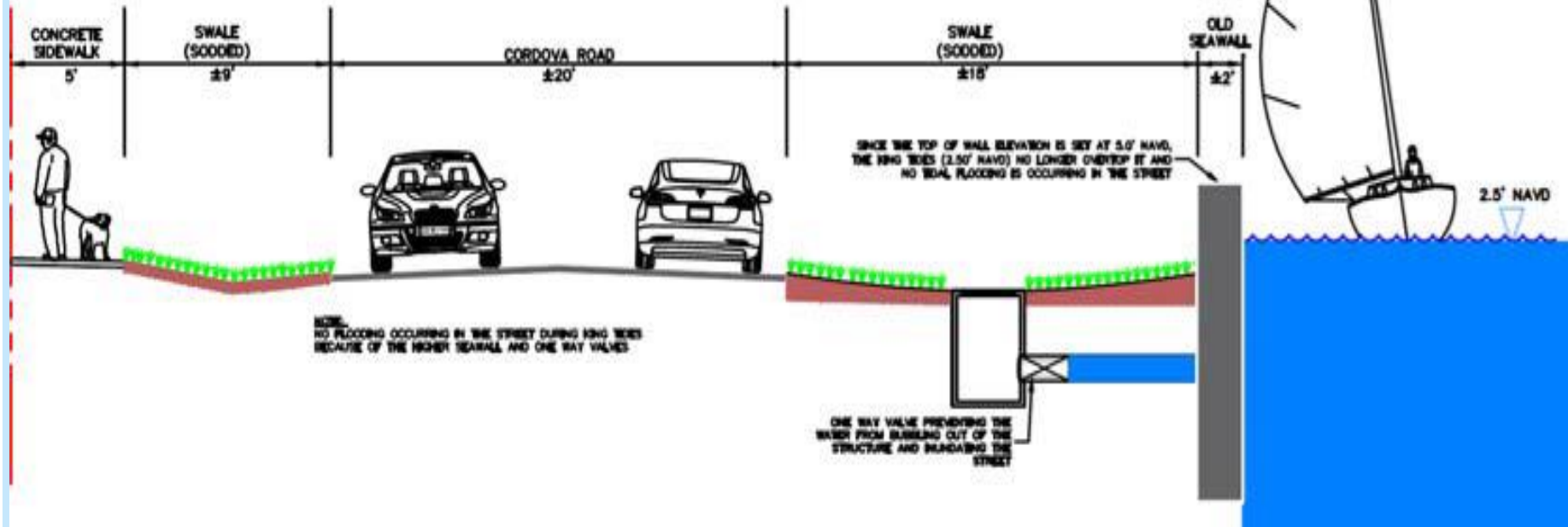
NEW SHEET PILE SEAWALL
WITH CONCRETE CAP
TOP OF WALL EL. 5.0' NAVD
THROUGHOUT

EXISTING DOCKS
HAVE BEEN REMOVED

Post Development Condition



PROPOSED SEAWALL: KING TIDES-NO RAINFALL



Benefits to Neighbors



Goal:

Provide a resilient coastal roadway addressing projected sea level rise through 2060.

- Replace existing seawall that is low and in disrepair
- Improve level of service and reduce tidal impacts by elevating seawall to *5.0 feet NAVD*, including:
 - Protect adjacent properties from wave and storm surge
 - Improve consistency of access to Rio Vista neighborhood
- Improve drainage along Cordova Road
- Provide a new roadway surface (driving)
- Remove unpermitted/unsightly water and electrical connections
- Swale rehabilitation/ Landscape Renewal

Questions?



CITY OF FORT LAUDERDALE