Final Design Progress Update on the 2nd Street Green Infrastructure Roadside Bioswale Project

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Cotleur & Hearing

WRMA

Presentation Outline

1. Opening Comments
2. Project Background
3. Storm Water Master Plan (SWMP)
4. Why 2nd Street?
5. Design Approach
6. Implementation Timeline
7. Landscape Design & Renderings
8. Questions

Project Team

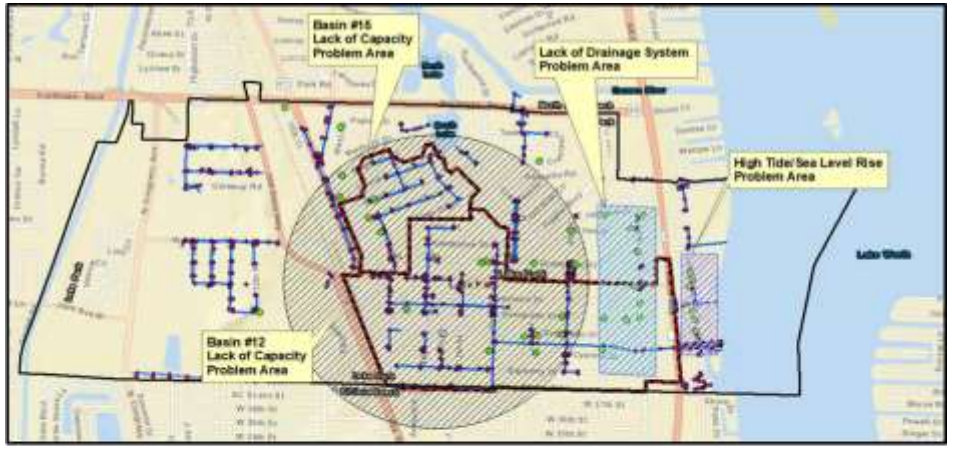
- **John D'Agostino** – Town Manager
- **Roberto Travieso** – Public Works Director
- **Raul Mercado** – Principal Engineer, WRMA
- **Michael Mercado** – Lead Design Engineer, WRMA
- **Don Hearing** -- Principal/Landscape Architect, Cotleur & Hearing
- **John Wille** – Capital Projects Manager

Project Background & Design Concept

MICHAEL MERCADO, PE

Stormwater Management Needs Assessment
Water Quantity

- Study showed that of the 10.62 miles of storm sewers (Approx. 29%) needs to be immediately (1-5 years) rehabilitated (Repaired/Replaced) and the rest within 20 years.
- Identifies key major capacity surcharge flooding problems along Southern Outfall (446 acre watershed)
- Identifies many areas without stormsewers with nuisance flooding such as along 2nd Street
- Identifies long term climate change (Sea Level Rise) challenges along 0.8 miles of LWI waterfront



Stormwater Management Needs Assessment
Water Quality

2/3 of the ToLP area Discharges untreated runoff to the impaired Lake Worth Lagoon

FDEP/NPDES Permit requires the ToLP to monitor runoff discharges from 14 outfalls

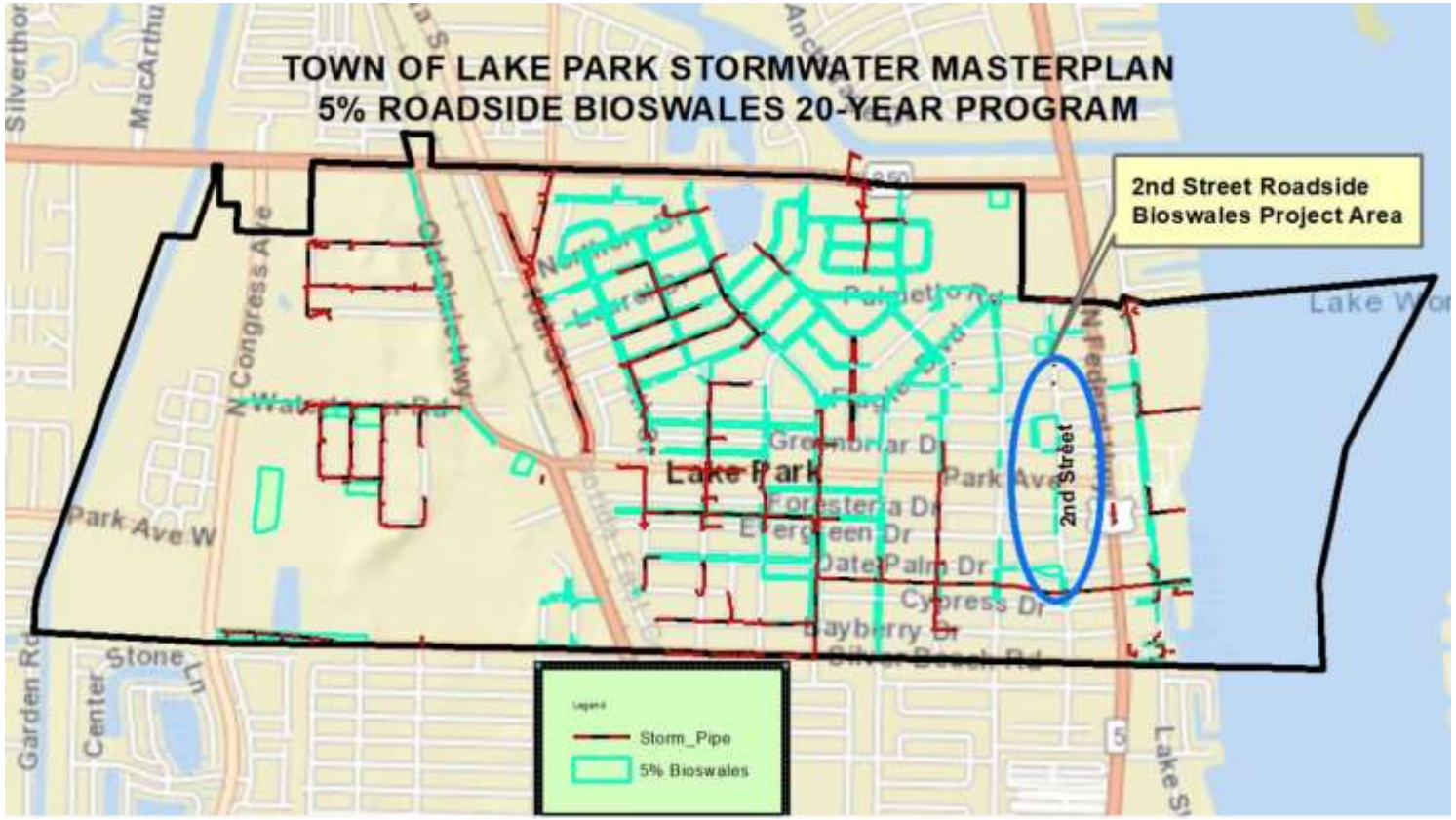
Receiving Waterbody	Table 4 Pollutant Loading Reductions (Lbs/year) for 5% Roadside Bioswales BMPs					
	BOD_5	TSS	TP	CU	ZN	N
LWL (Current BMPs)	22,418	98,253	883	53.7	261.5	10,630
LWL (Proposed Bioswales)	20,081	76,444	796	50.8	238.6	10,366
Reduction %	**10.4**	**22.2**	**9.8**	**5.4**	**8.8**	**2.5**

Bioswales along 5% of the ToLP ROW's will reduce sediment pollutants loadings to the LWL by as much as 22% (TSS)

Stormwater Master Plan (SWMP)

- Updated in 2019-2020
- Adopted by Town Commission in 2021
- Provided the incremental conversion of 5% roadside swales to green infrastructure (bioswales/biodentention areas)
- Recommends the use of Stormwater fees exclusively to cover O&M costs (no Capital Improvements)
- Recommends the use of federal grants for project Capital Improvements

Stormwater Master Plan Approach
Green Infrastructure For Climate Change



Higher Intensity Rainfall is Causing More Frequent Nuisance Flooding Along 2nd Street Intersections

5% ROADSIDE BIOSWALES 20-YEAR PROGRAM

FIRST PROJECT - BIOSWALES ALONG 2ND STREET ROW

Why 2ND Street ?

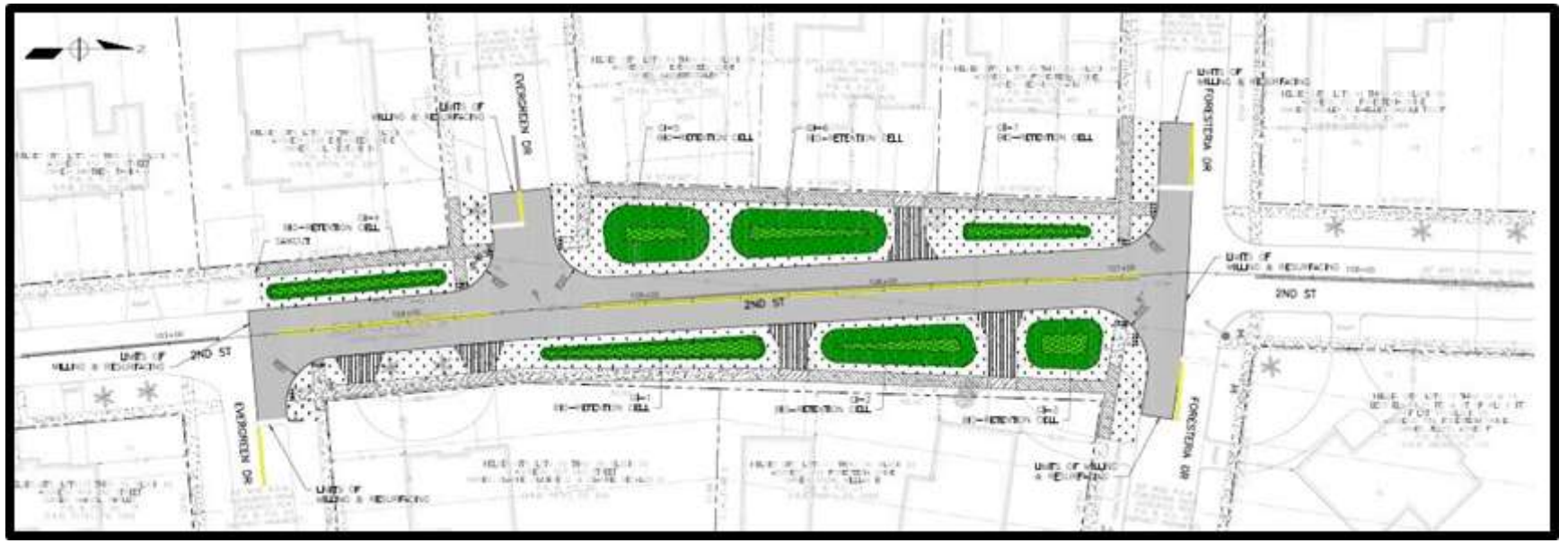
- Extra pavement was added to the ROW in the past without grading
- Additional impervious area runoff creates ponding and nuisance flooding at intersections
- Opportunity for design of a GI-Based Bioswale to address nuisance flooding and water quality NPDES requirements

FORESTERIA DRIVE

EVERGREEN DRIVE

Prototype Bioswale Design Solution
Surface Component

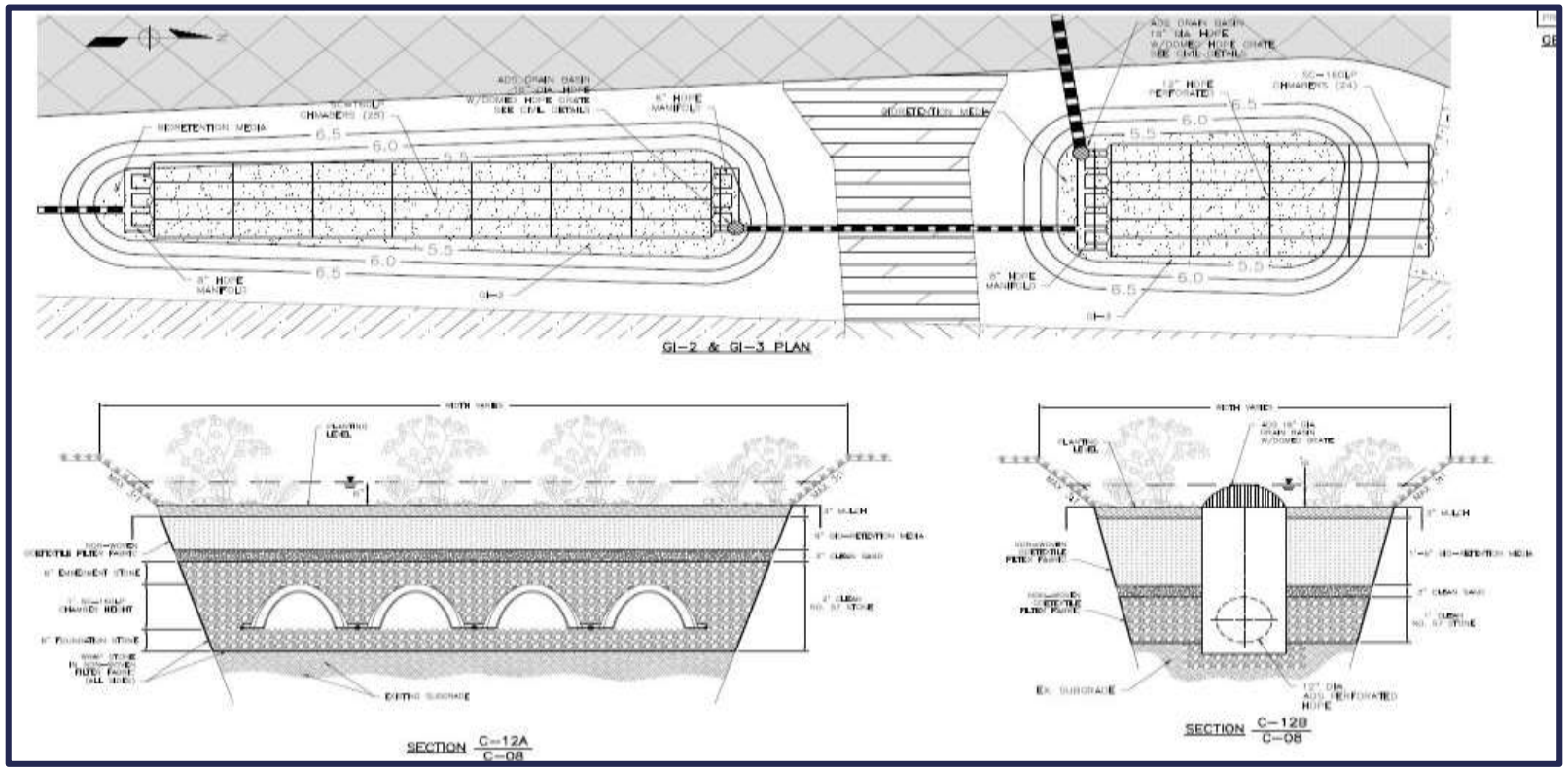
- Surface (planted) bioswales captures first flush of runoff for infiltration and evapotranspiration



- ❑ **Bioswales green-planted areas beautify the right-of-way**
- ❑ **Bioswales soils layers provide mulch for additional water quality treatment of runoff**

Prototype Bioswale Design Solution
Underground Component

- Underground Storage Filtration Chambers provide additional runoff volume treatment capacity



- ❑ **Interconnected chambers for maximum utilization of underground space**
- ❑ **Chambers can be accessed for maintenance to clear debris**

Project Landscape Design

NICOLE PLUNKETT, ASLA, PLA, AICP

Landscape Design Approach

- Observe street design standards published by FDOT

  Clear Zone: The unobstructed, traversable area beyond the edge of the traveled way for the recovery of errant vehicles. Source: Florida Green Book

- Clear Zone Design Guideline from edge of traveled lane:
  - 6’ <400 Average Daily Traffic (ADT)

- Standards also applicable to landscape design

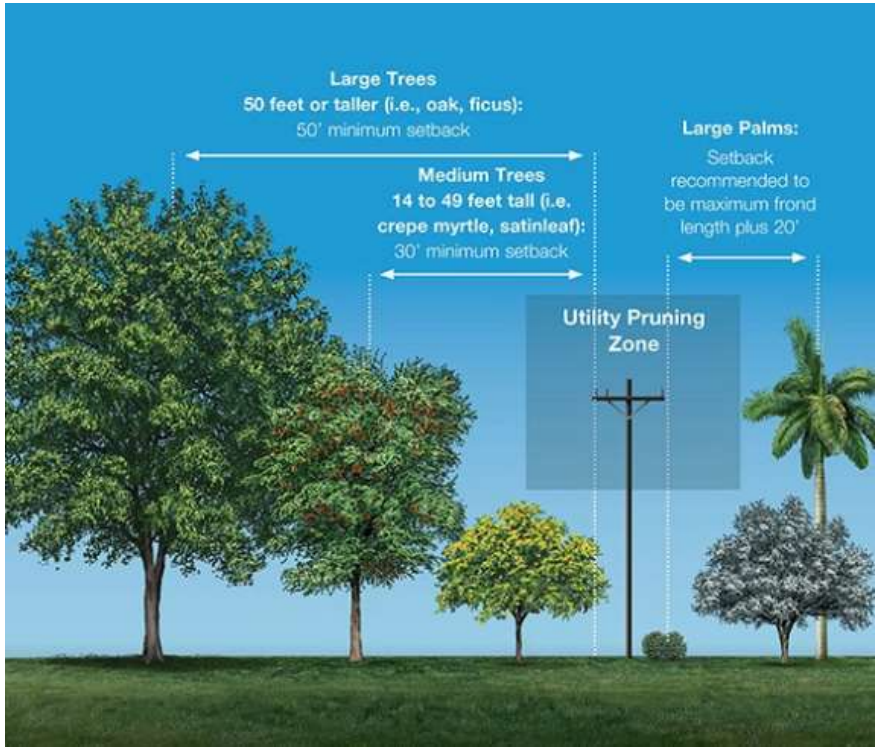
Landscape Design Approach

Observe applicable Regulations for utility operators in the Town:

SEACOAST UTILITY AUTHORITY

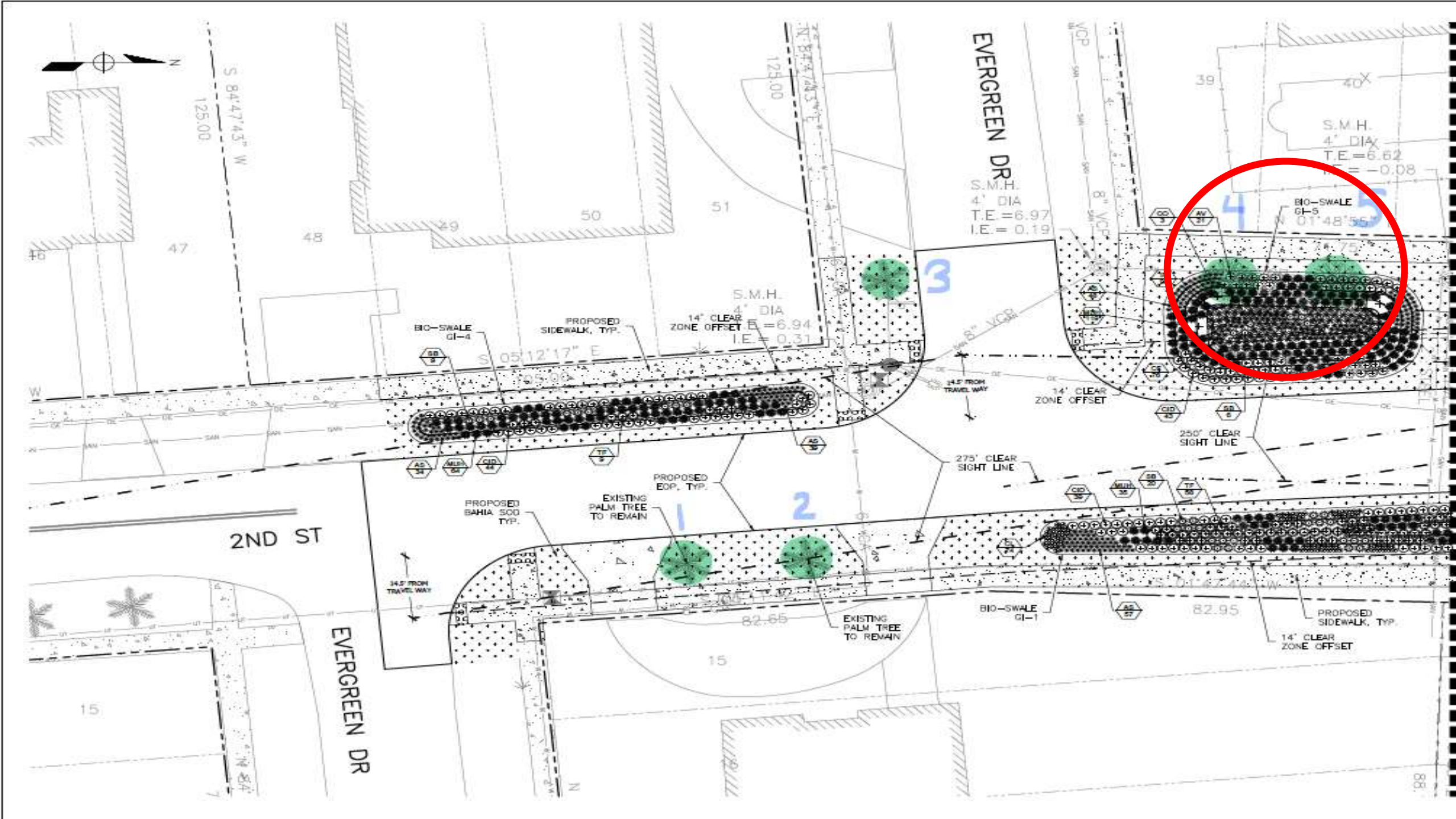
FPL

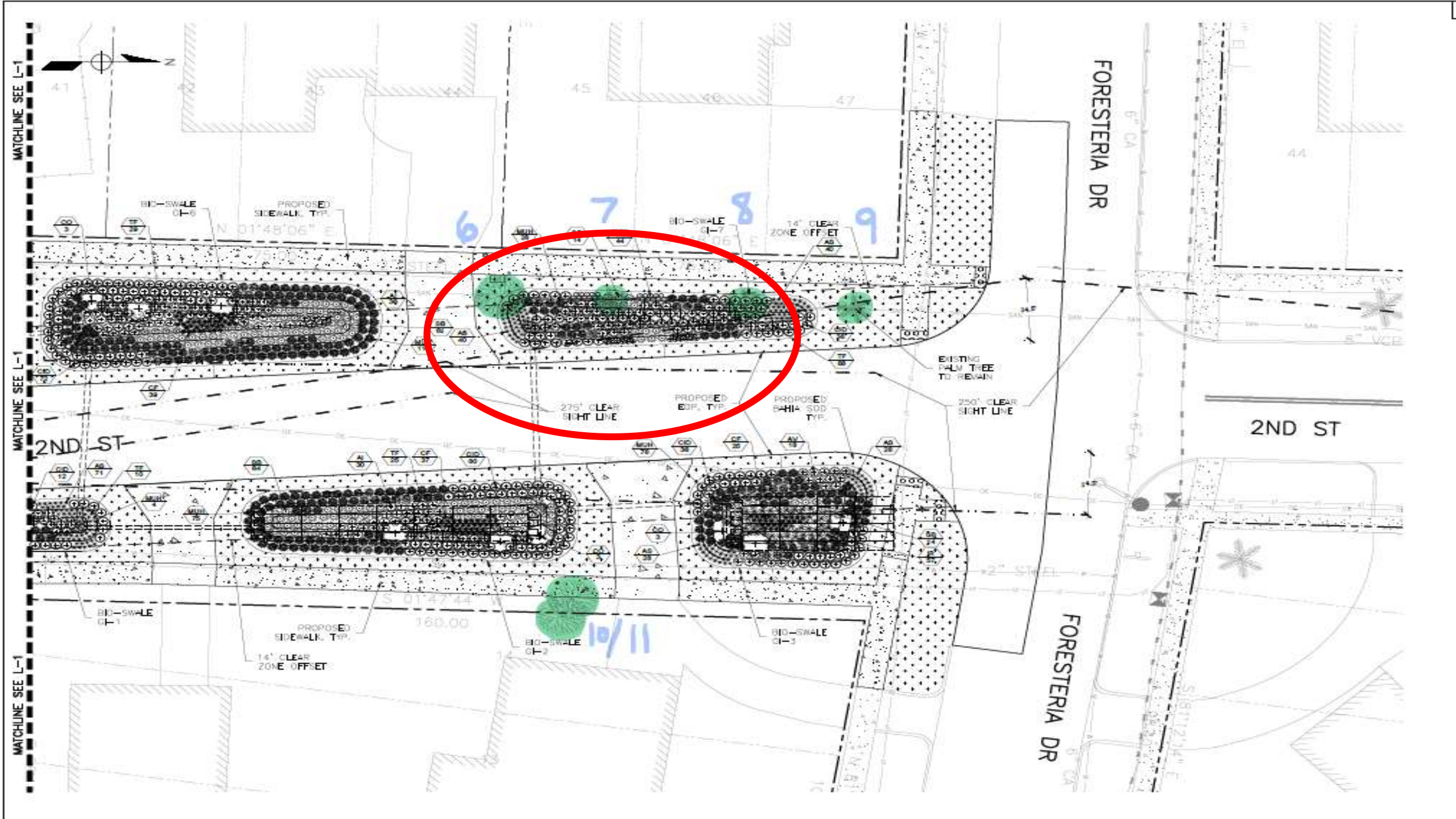
- **Small/Medium Trees & Palm Trees:** No closer than 10 feet to utility structure
- **Large Trees:** No closer than 15 feet to utility structure



Existing Canopy Tree/Palm Tree Conflicts

- Canopy Trees in project area: **5** | Palm Trees in project area: **6**
- All **(11)** trees/palm trees in project area are currently unpermitted
- Some trees/palm trees are within the FDOT-mandated Clear Zone
- Proposed project improvements and grading necessitates the removal/relocation of (5) canopy and palm trees (No.'s 4,5,6,7, and 8)
- Planned coordination with public property owners to relocate trees onto private property, where desired and possible, during project implementation
- New street trees may be included in Bioswale design for other locations, depending on compliance with Clear Zone, Seacoast Utilities', and FPL setback criteria


EVERGREEN DR
2ND ST
EVERGREEN DR
BIO-SWALE GI-4
PROPOSED SIDEWALK, TYP.
14' CLEAR ZONE OFFSET
PROPOSED EOP, TYP.
PROPOSED BAHIA SOD TYP.
EXISTING PALM TREE TO REMAIN
14.5' FROM TRAVEL WAY
275' CLEAR SIGHT LINE
250' CLEAR SIGHT LINE
BIO-SWALE GI-5
BIO-SWALE GI-1
S.M.H. 4' DIA T.E.=6.97 I.E.=0.19
S.M.H. 4' DIA T.E.=6.94 I.E.=0.31
S.M.H. 4' DIA T.E.=6.62
S 84°47'43" W 125.00
S 05°12'17" E 85.00
82.65
82.95
1
2
3
4
5


MATCHLINE SEE L-1
MATCHLINE SEE L-1
MATCHLINE SEE L-1
FORESTERIA DR
FORESTERIA DR
2ND ST
2ND ST
BIO-SWALE GI-6
PROPOSED SIDEWALK TYP.
BIO-SWALE GI-7
14' CLEAR ZONE OFFSET
EXISTING PALM TREE TO REMAIN
275' CLEAR SIGHT LINE
PROPOSED EGF, TYP.
PROPOSED BAHIA SOD TYP.
250' CLEAR SIGHT LINE
BIO-SWALE GI-1
PROPOSED SIDEWALK TYP.
14' CLEAR ZONE OFFSET
BIO-SWALE GI-2
BIO-SWALE GI-3
6
7
8
9
10/11

Project Landscape Renderings

NICOLE PLUNKETT, ASLA, PLA, AICP

2ND STREET
Lake Park, Florida

DEPARTMENT OF PULIC WORKS

Cotleur & Hearing

CROSS SECTION - LOCATION 105+00.00

PLANT PALETTE |


BUTTONBUSH


DWARF COCOPLUM


WIREGRASS


SAND CORDGRASS


SWAMP MILKWEED


CANNA LILY


CHALKY BROOMSEDGE BLUESTEM


BLUE FLAG IRIS


LEAVENWORTH'S TICKSEED


MUHLY GRASS


DWARF FAKAHATCHEE GRASS

BIOSWALE / RAIN GARDEN

2ND STREET
Lake Park, Florida

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Lake Park, Florida

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Implementation Timeline & Next Steps

ROBERTO TRAVIESO

Project Implementation Timeline

- **Design & Bidding (Design partially funded by FDEP Coastal Partnership Initiative Grant)**
  - 100% Design Plans & Specifications: November 2022
  - Final Regulatory Permits: December 2022
  - Bidding Advertisement: February 2023
  - Contractor Selection: March – April 2023
  - Contract Negotiations: May – June 2023
- **Construction (Funded by Resilient Florida Grant)**
  - Mobilization/Start Up: July 2023
  - Completion/Close Out: July 2024

Questions