

Presentation

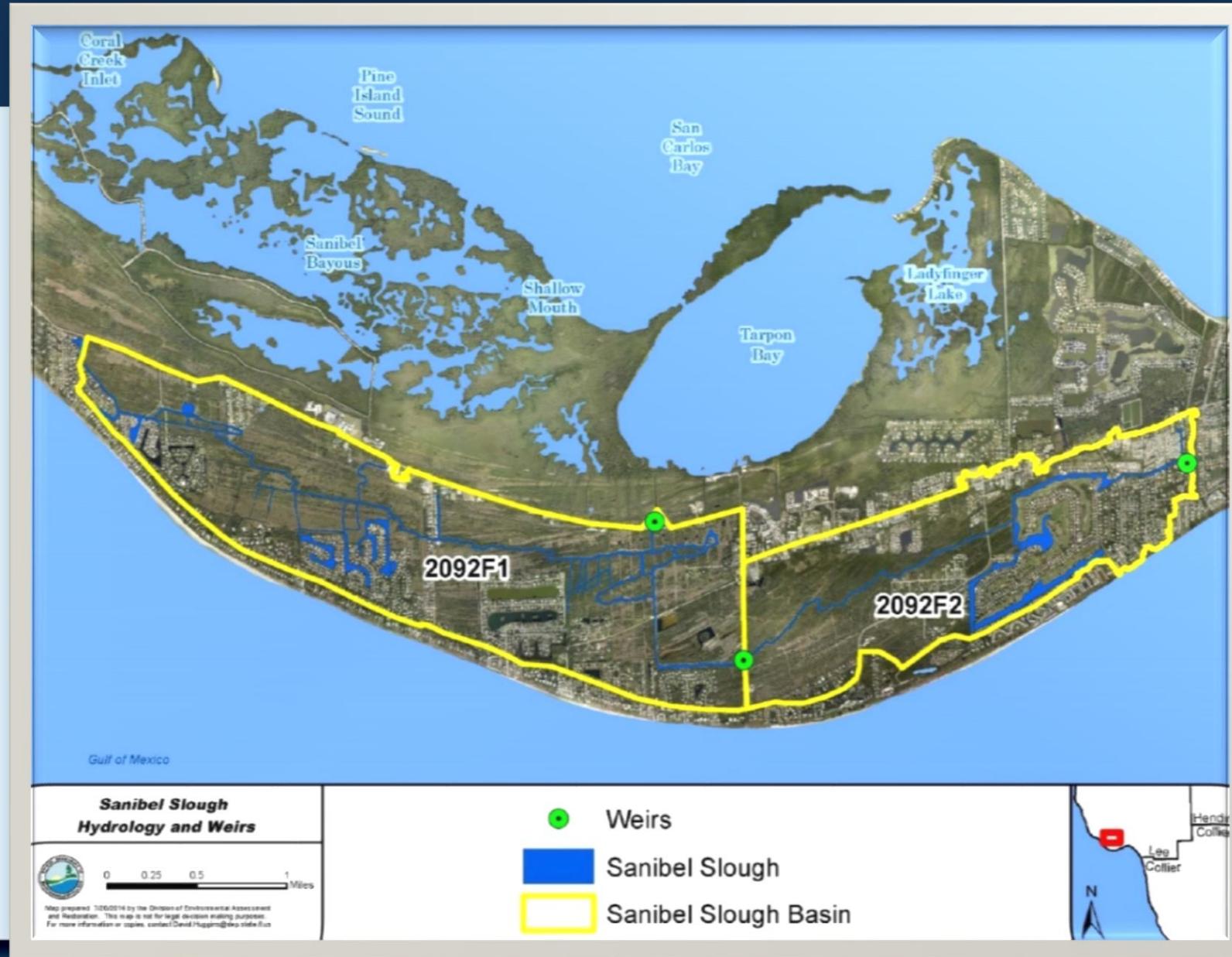
Jordan Marsh Water Quality Treatment Park

October 3, 2017

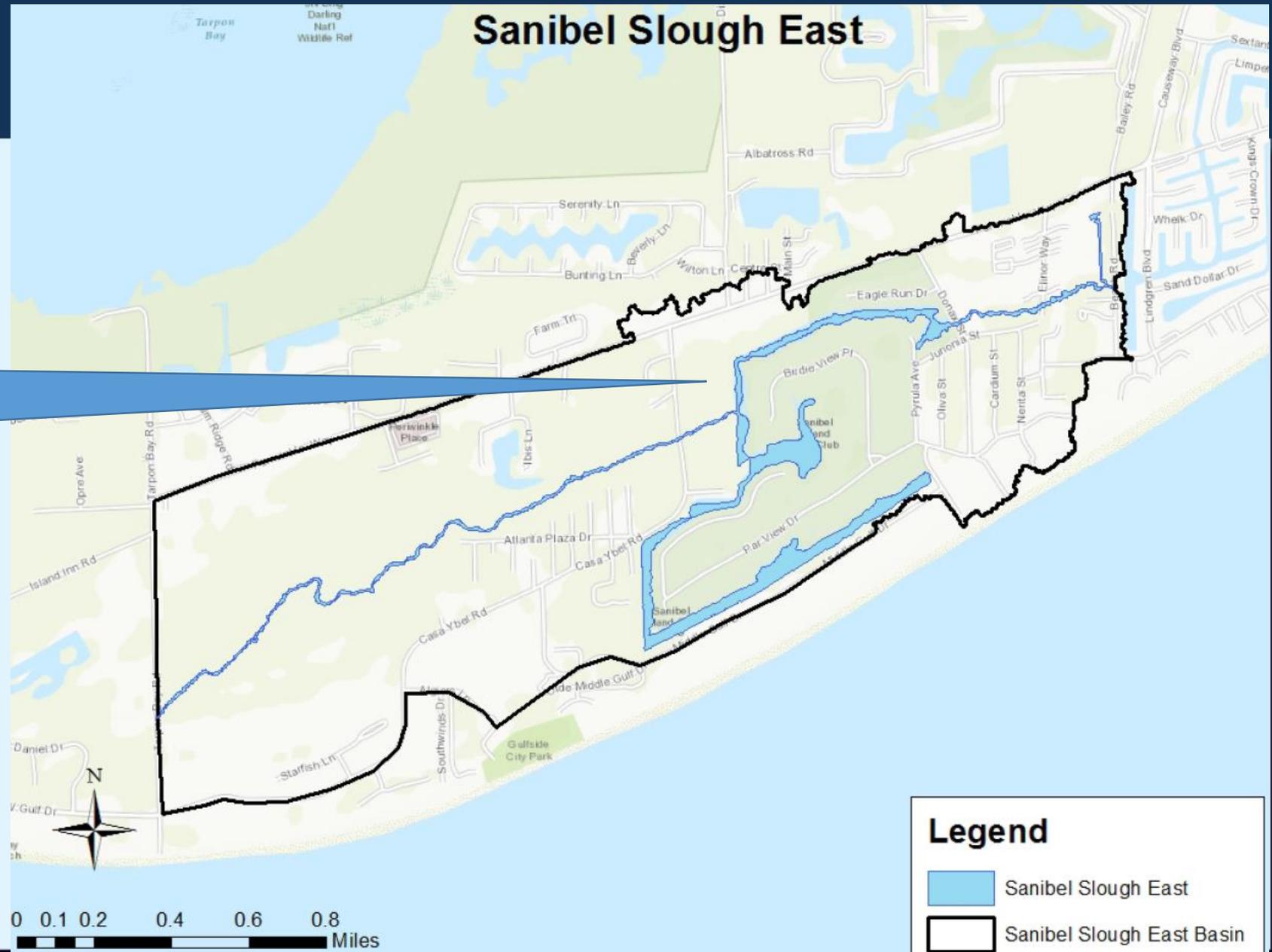


AIM Engineering
& Surveying, Inc.

Sanibel East & West Basins



Subject Site



Project Scope & Objectives

- **Scope:** *Design & permit a filter marsh at the subject site.*
- **Objectives:**
 - *To improve the water quality in the Sanibel Slough.*
 - *To meet the Total Maximum Daily Load (TMDL) requirements.*
 - *To enhance the existing wildlife habitat on the subject site.*
 - *To educate the park visitors on the Best Management Practices (BMPs) used in TMDL reduction.*

Partnership with SCCF

- The filter marsh is to be located on:
 - 6 acres of City-owned land (*Jordan Marsh Preserve*)
 - Portion of 8.5-acres of Sanibel-Captiva Conservation Foundation (SCCF)-owned land (*Bob Wigley Preserve*)



Project Description

- **Location:**

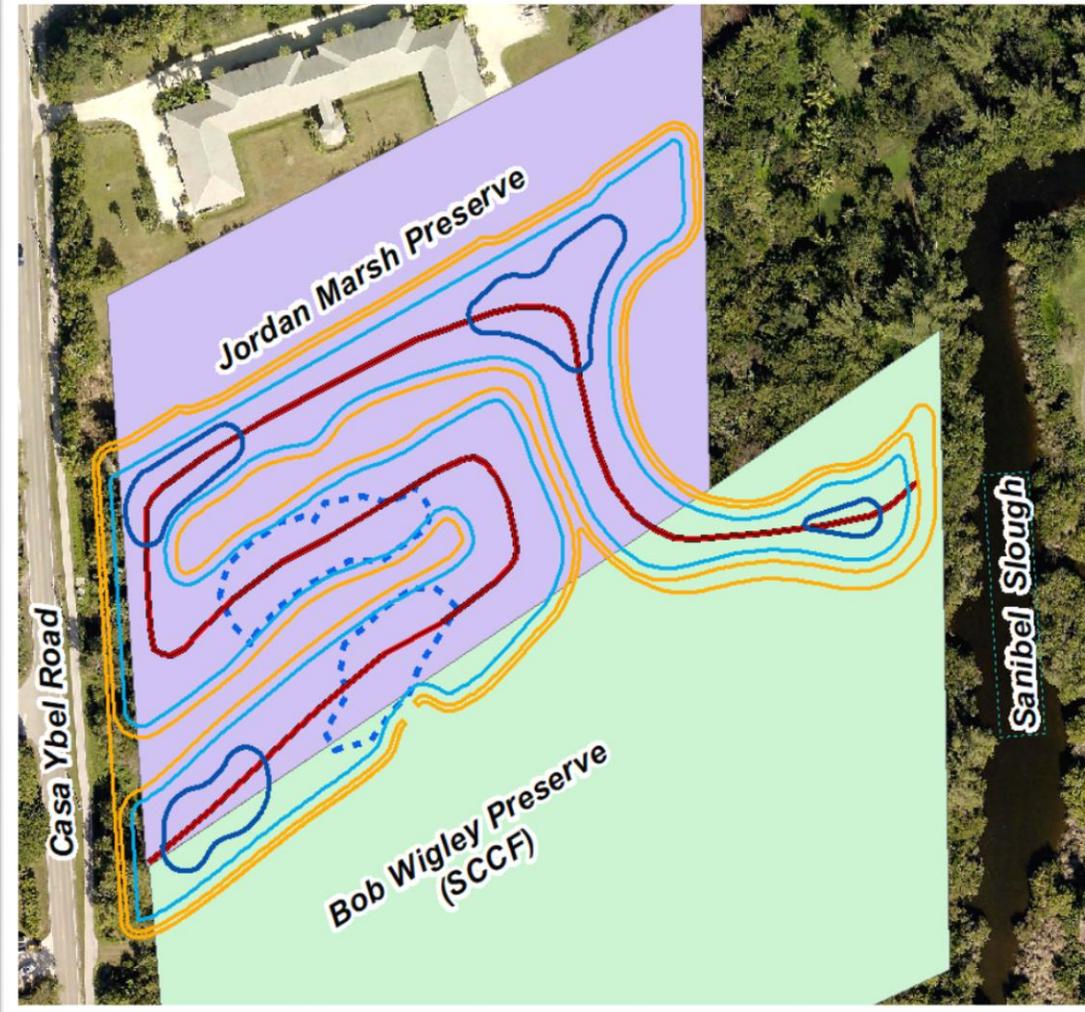
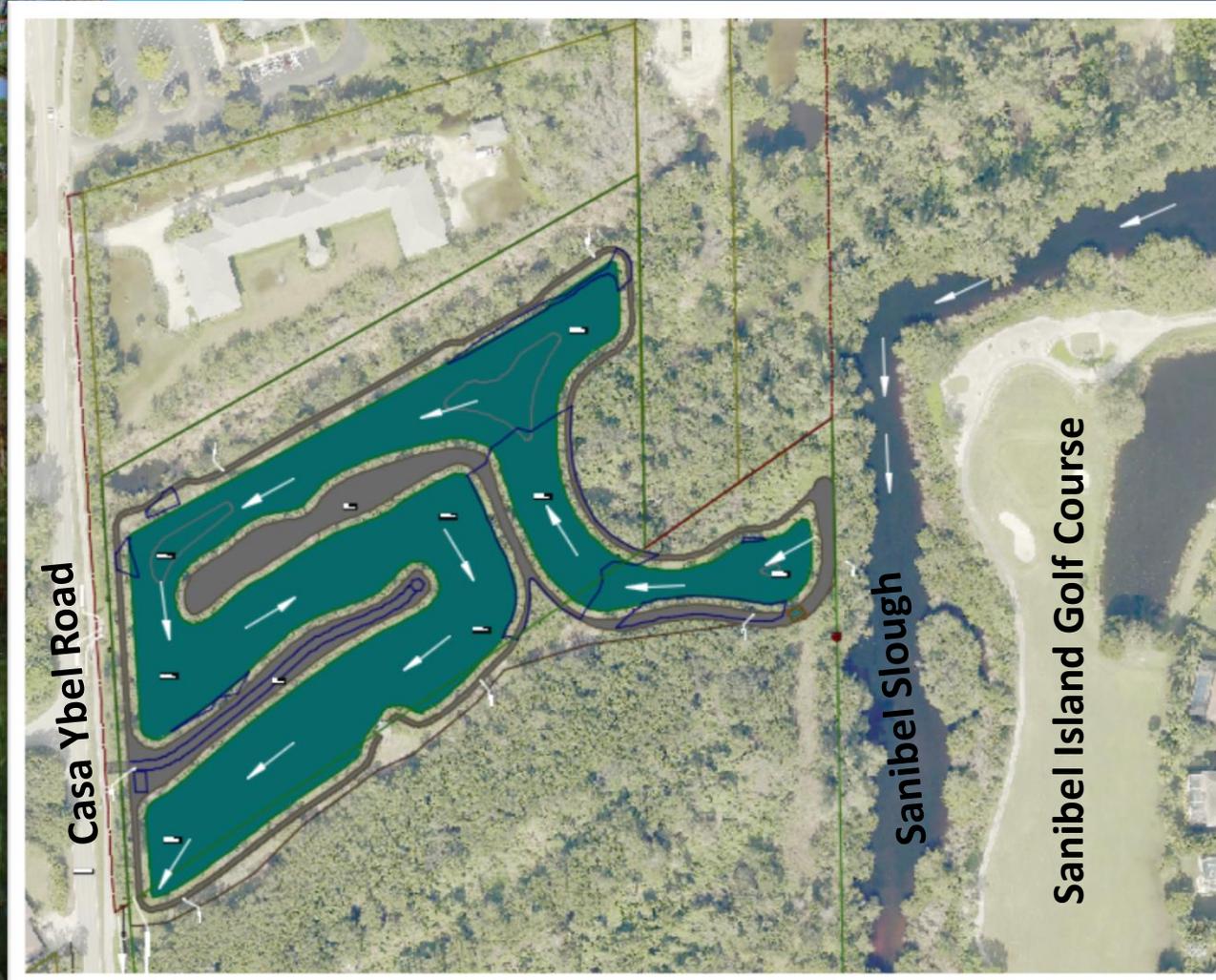
- *Near the intersection of Periwinkle Way and Casa Ybel Road, adjacent to Sanibel Slough*

- **Project Area:**

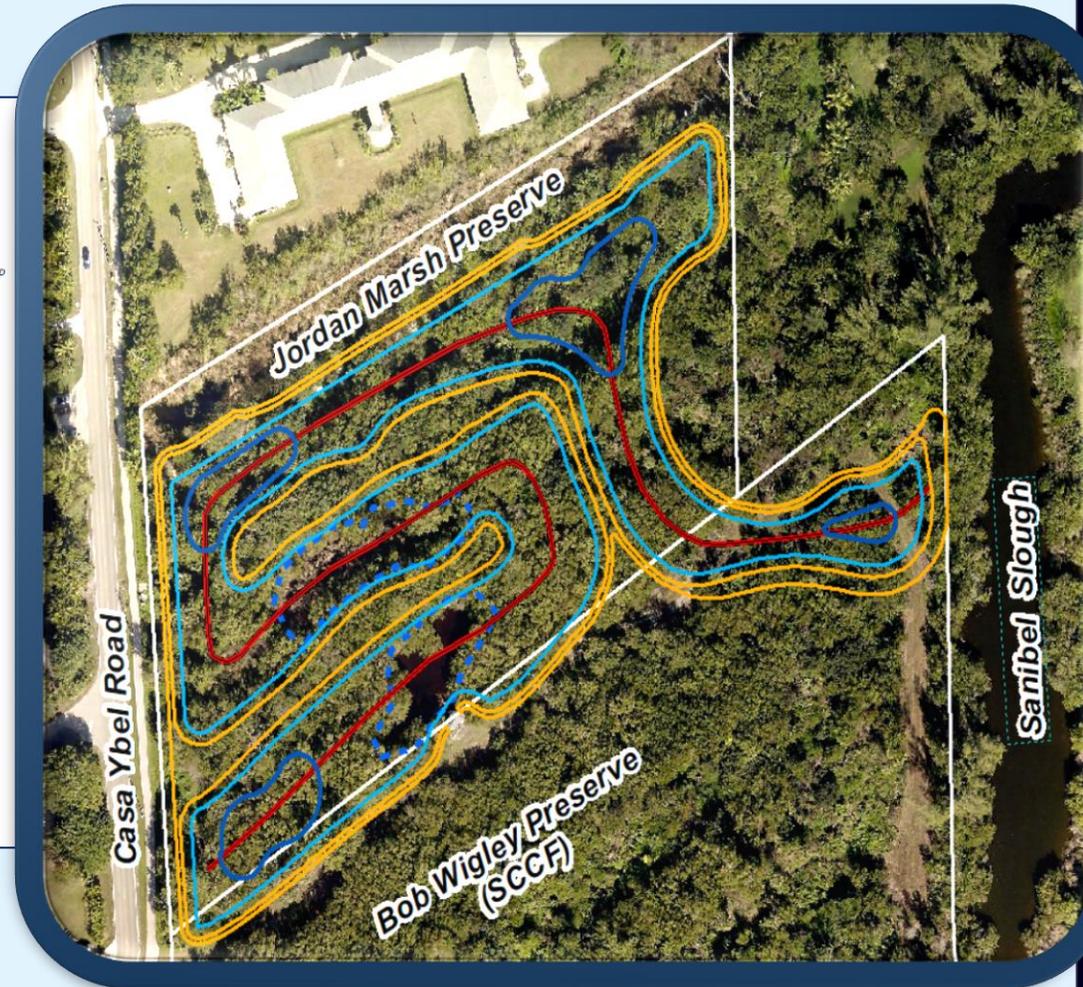
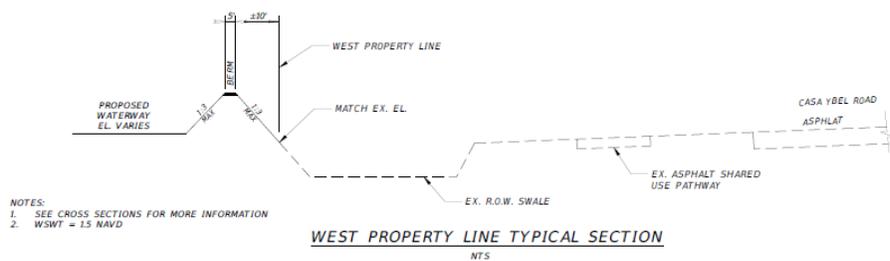
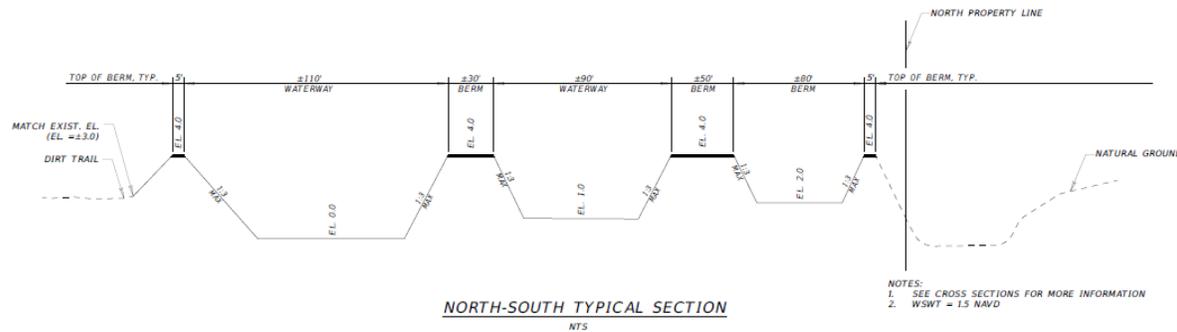
- *±6.8 acres*
- *5.5 acres in the N. parcel (Jordan Marsh Preserve)*
- *1.3 acres in the S. parcel (Bob Wigley Preserve)*



Project Site



Proposed Design



Impacts to Existing Vegetation

Impacts to existing vegetation due to grading and sloping required to create a meandering wetland filter marsh.



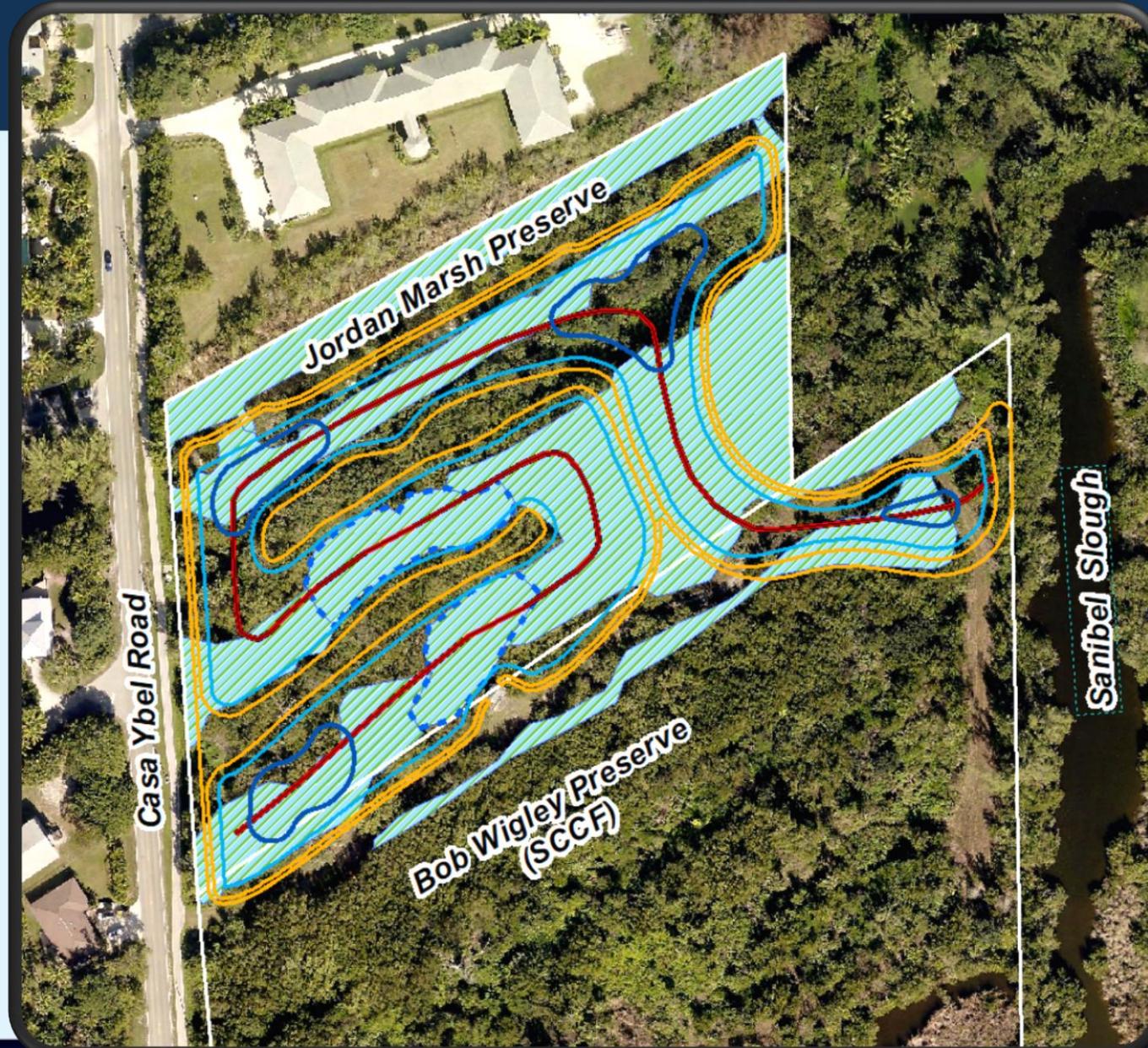
Impacts to Existing Vegetation

Impacts to existing vegetation due to the creation of the berms to contain and direct the water through the proposed filter marsh.



Enhancement

The proposed project will provide increased wetland habitat & water quality enhancement within the eastern Sanibel Slough



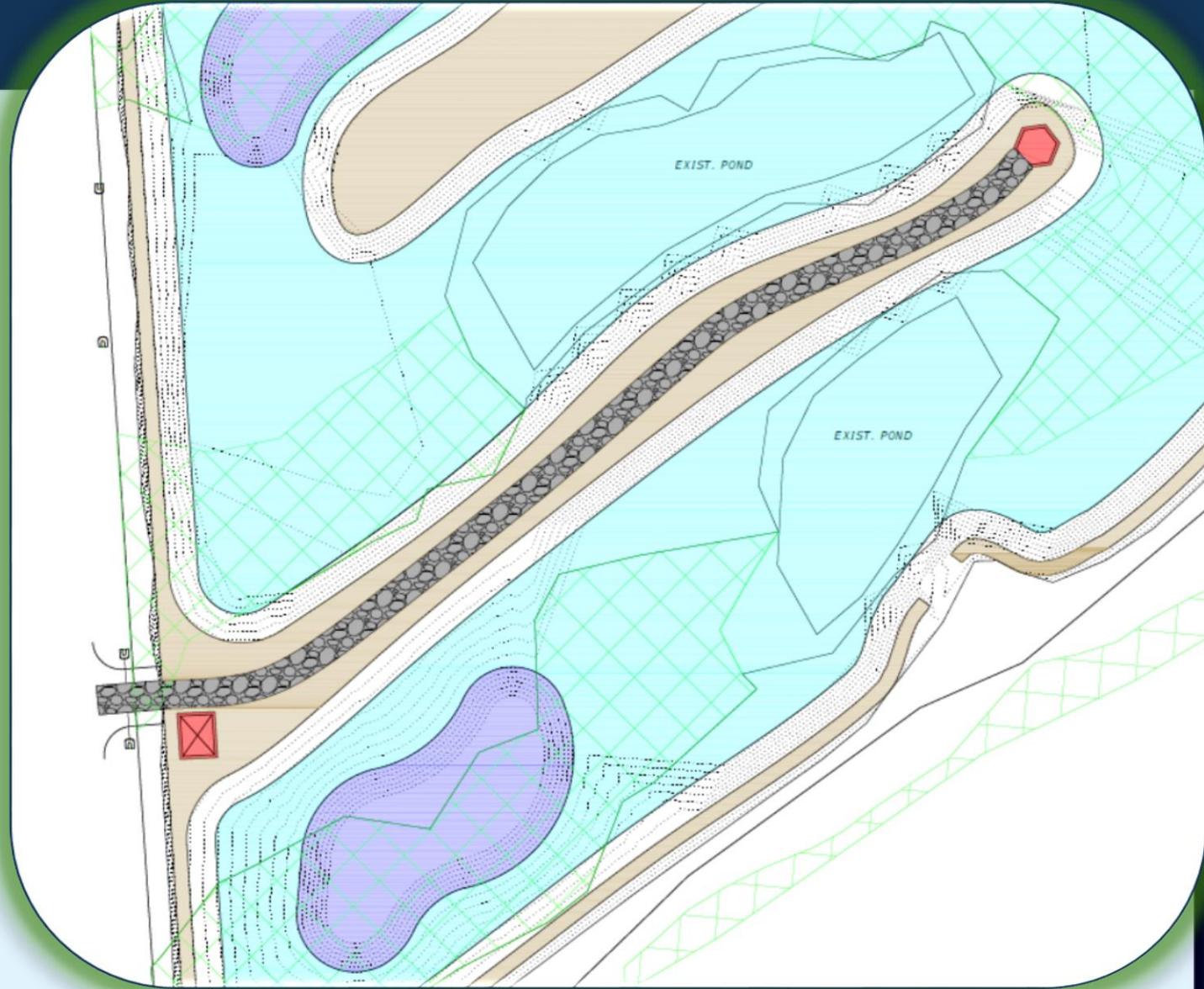
Facilities



Facilities

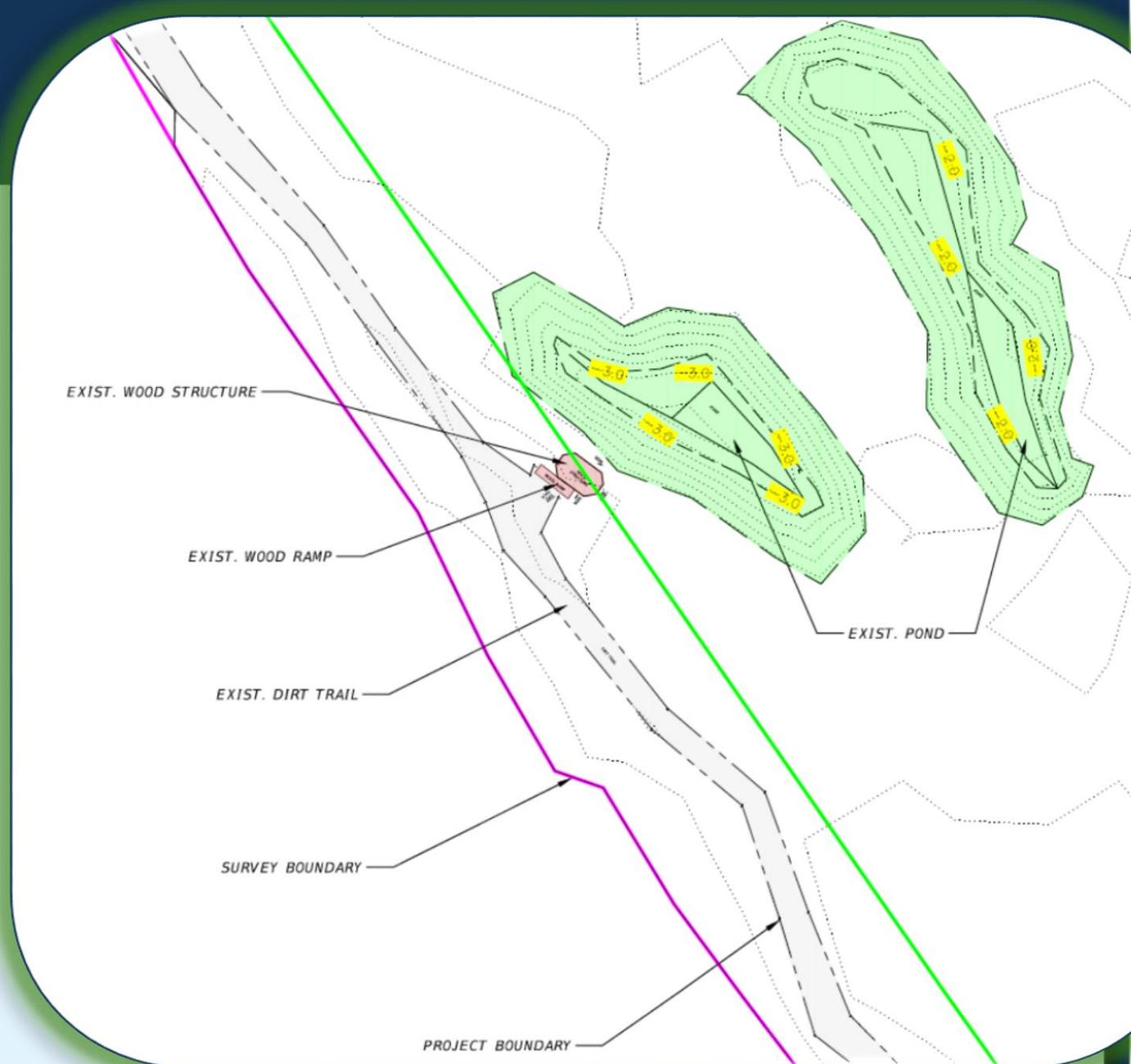
Proposed Facilities:

- Welcome Kiosk
- Shell Trail
- Education/
Observation Tower



Facilities

Existing Facilities: Existing SCCF Gazebo



Public Access in Phase II

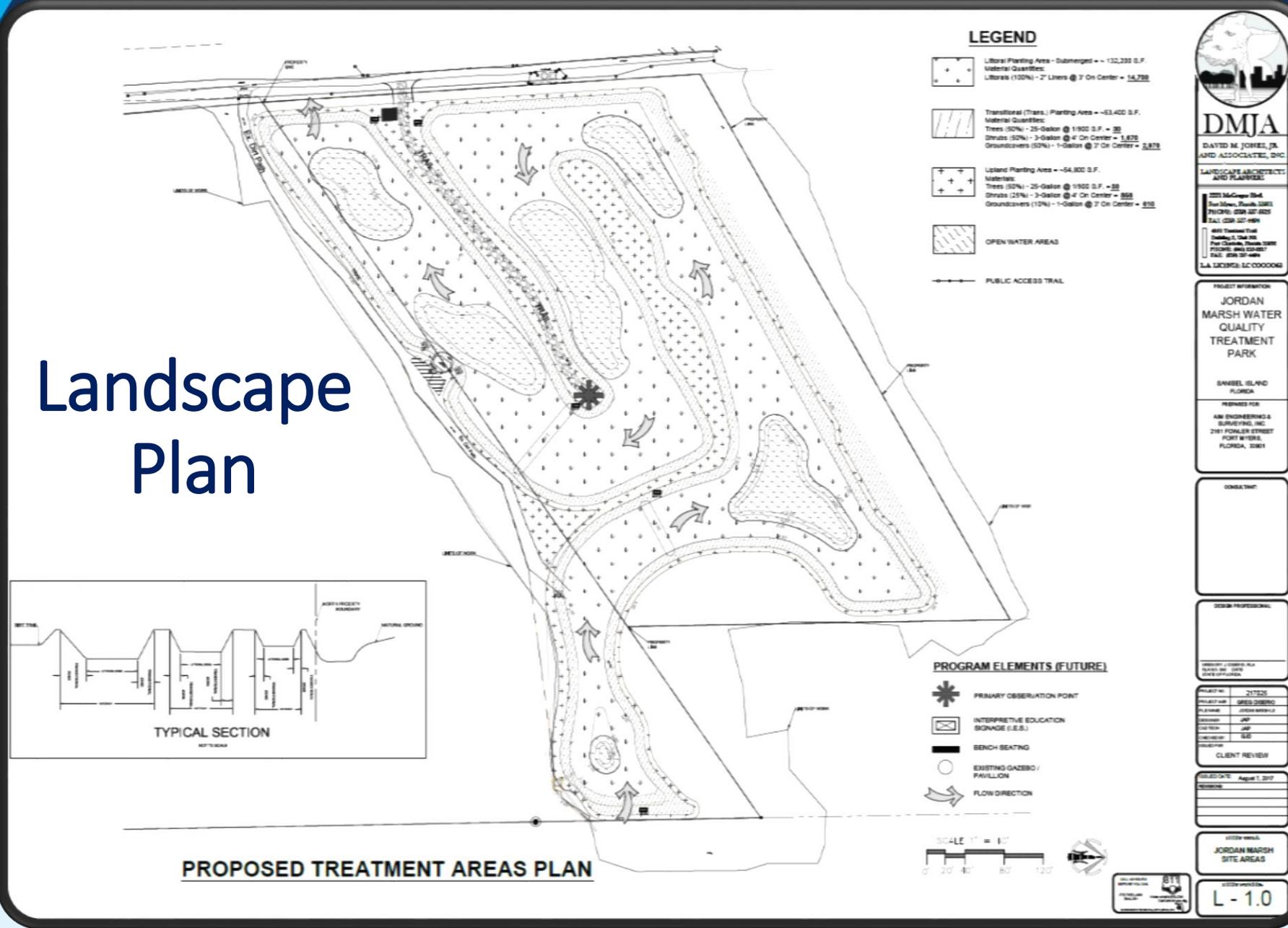
All public access and educational components will be included in Phase II of the Project



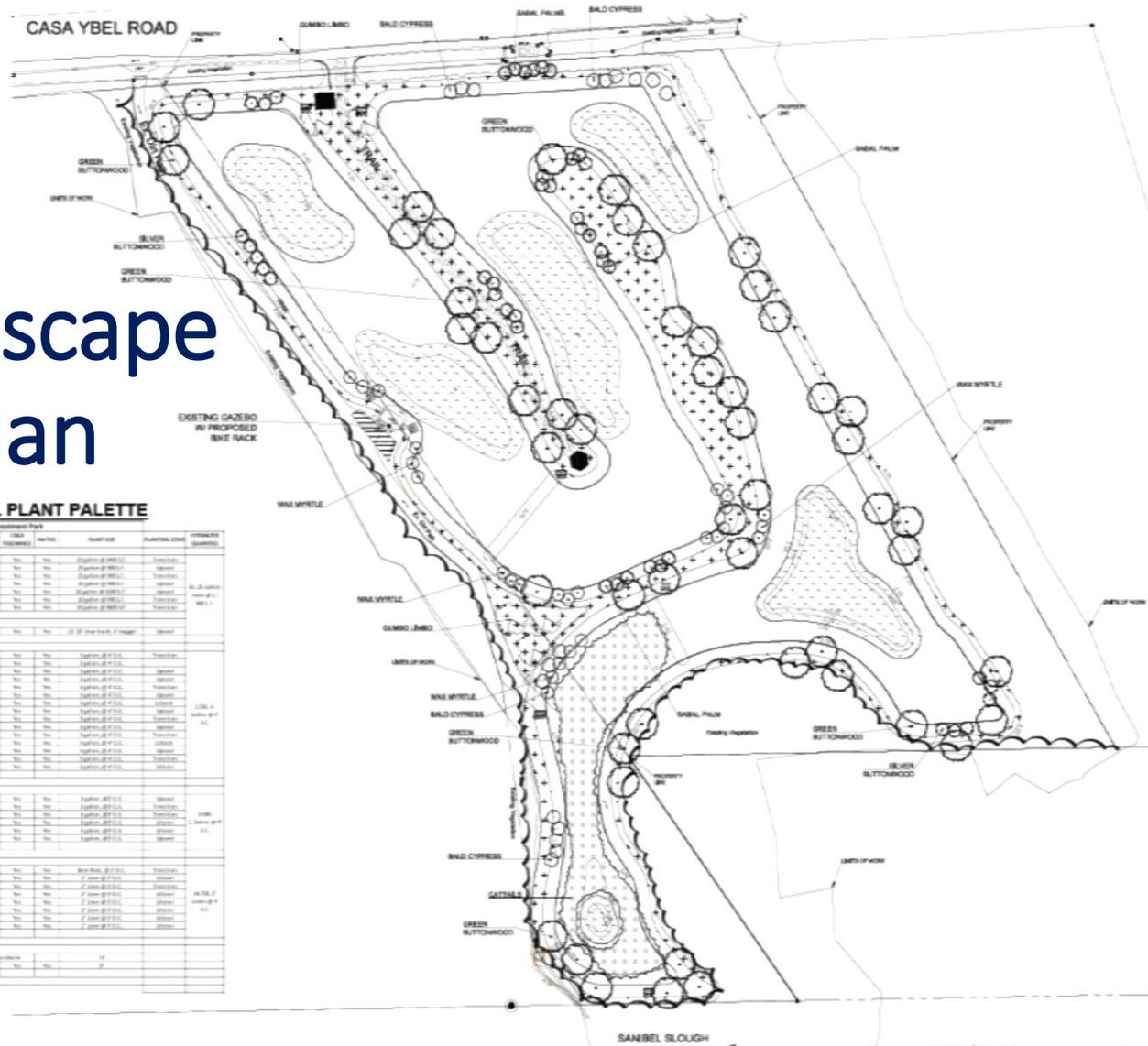
Landscape Plan



Landscape Plan



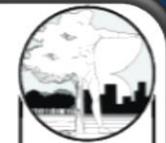
Landscape Plan



CONCEPTUAL PLANT PALETTE

PLANT CODE	SCIENTIFIC NAME	COMMON NAME	DBH	HEIGHT	PLANT USE	PLANTING CODE	PLANTING QUANTITY
0101	Avicennia nitida	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0102	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0103	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0104	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0105	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0106	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0107	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0108	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0109	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0110	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
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0112	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0113	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0114	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0115	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0116	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0117	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0118	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0119	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0120	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0121	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0122	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0123	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0124	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0125	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0126	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
0127	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0128	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
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0131	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0132	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000
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0199	Avicennia germinata	Black Mangrove	Yes	Yes	Shaded (S)	1000	1000
0200	Avicennia marina	White Mangrove	Yes	Yes	Shaded (S)	1000	1000

CONCEPTUAL LANDSCAPE PLAN



DMJA

DAVID M. JONES, JR.
AND ASSOCIATES, INC.
LANDSCAPE ARCHITECTS
AND PLANNERS

2225 McGregor Blvd.
Fort Myers, Florida 33901
PHONE: (889) 337-4325
FAX: (889) 337-4889
4010 Tamiami Trail
Building 1, Fort Lee
Fort Lee, Florida 33407
PHONE: (889) 337-4325
FAX: (889) 337-4889
L.A. LICENSE: LC000006

PROJECT INFORMATION:
JORDAN MARSH WATER QUALITY TREATMENT PARK

SANBEL ISLAND
FLORIDA
PREPARED FOR:
A&M ENGINEERING &
SURVEYING, INC.
2161 FOWLER STREET
FORT MYERS,
FLORIDA, 33901

CONSULTANT:

DESIGN PROFESSIONAL:

DATE: 11/11/2022

PROJECT NO.: 217022
PROJECT NAME: JORDAN MARSH
CONCEPTUAL LANDSCAPE PLAN
DATE: 11/11/2022
DRAWN BY: JMF
CHECKED BY: GED
SCALE: 1" = 40'

CLIENT REVIEW:

DATE: _____
SIGNATURE: _____

DESIGNER:

DATE: _____
SIGNATURE: _____

JORDAN MARSH
CONCEPTUAL
RESTORATION PLAN

DATE: 11/11/2022
SCALE: 1" = 40'

Landscape Plan



LEGEND

- Upland Planting Area - Submerged - ~ 132,200 S.F.
Material Quantities:
Littorals (100%) - 2" Litters @ 3' On Center = 14,738
- Transitional (Trans.) Planting Area - ~ 63,432 S.F.
Material Quantities:
Trees (50%) - 25-Gallon @ 1/900 S.F. = 35
Shrubs (50%) - 3-Gallon @ 4' On Center = 3,870
Grasscovers (50%) - 1-Gallon @ 3' On Center = 2,878
- Upland Planting Area - ~ 64,933 S.F.
Material:
Trees (50%) - 25-Gallon @ 1/900 S.F. = 35
Shrubs (25%) - 3-Gallon @ 4' On Center = 558
Grasscovers (10%) - 1-Gallon @ 3' On Center = 516
- OPEN WATER AREA
- CATTAIL PLANTING AND HARVESTING AREA

CONCEPTUAL PLANT PALETTE

PLANT	SCIENTIFIC NAME	COMMON NAME	USDA HARDINESS	PLANT TYPE	PLANT SIZE	PLANTING QUANTITY	PLANTING NOTES
TREES							
Avicennia nitida	Black Mangrove	Yes	Yes	25 Gallon @ 1/900 S.F.	35		Transition
Avicennia marina	Black Mangrove	Yes	Yes	25 Gallon @ 1/900 S.F.	35		Transition
Conocarpus erectus	Queen Palmetto	Yes	Yes	25 Gallon @ 1/900 S.F.	35		Transition
Leptocarpus retusus	White Mangrove	Yes	Yes	25 Gallon @ 1/900 S.F.	35		Transition
Laguncularia racemosa	White Mangrove	Yes	Yes	25 Gallon @ 1/900 S.F.	35		Transition
Styrodia virginica	Red Mangrove	Yes	Yes	25 Gallon @ 1/900 S.F.	35		Transition
SHRUBS							
Avicennia nitida	Black Mangrove	Yes	Yes	3 Gallon @ 4' On Center	3,870		Transition
Avicennia marina	Black Mangrove	Yes	Yes	3 Gallon @ 4' On Center	3,870		Transition
Conocarpus erectus	Queen Palmetto	Yes	Yes	3 Gallon @ 4' On Center	3,870		Transition
Leptocarpus retusus	White Mangrove	Yes	Yes	3 Gallon @ 4' On Center	3,870		Transition
Laguncularia racemosa	White Mangrove	Yes	Yes	3 Gallon @ 4' On Center	3,870		Transition
Styrodia virginica	Red Mangrove	Yes	Yes	3 Gallon @ 4' On Center	3,870		Transition
GRASSCOVERS							
Styrodia virginica	Red Mangrove	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
WATER							
Hydrocotyle verticillata	Water Hyacinth	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
OTHER							
Avicennia nitida	Black Mangrove	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
Avicennia marina	Black Mangrove	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
Conocarpus erectus	Queen Palmetto	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
Leptocarpus retusus	White Mangrove	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
Laguncularia racemosa	White Mangrove	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition
Styrodia virginica	Red Mangrove	Yes	Yes	1 Gallon @ 3' On Center	2,878		Transition

PROGRAM ELEMENTS (FUTURE)

- PRIMARY OBSERVATION POINT
- INTERPRETIVE EDUCATION SIGNAGE (I.E.S.)
- BENCH SEATING
- EXISTING GAZEBO / PAVILLION
- FLOW DIRECTION



DMJA
DAVID M. JOHNS, JR.
AND ASSOCIATES, INC.

LANDSCAPE ARCHITECTS
AND PLANNERS
2200 McGowan Blvd.
Fort Myers, Florida 33901
PHONE: (813) 337-5525
FAX: (813) 337-5991
4800 Thomas Road
Fort Charlotte, Florida 33901
PHONE: (813) 638-0727
FAX: (813) 337-5991
L.A. LICENSE: LC 0000066

PROJECT INFORMATION:
JORDAN MARSH WATER QUALITY TREATMENT PARK
SANIBEL ISLAND, FLORIDA
PREPARED FOR:
AM ENGINEERING & SURVEYING, INC.
2761 FOWLER STREET
FORT MYERS, FLORIDA, 33901

CONSULTANT:

DESIGN PROFESSIONAL:

ISSUED BY: JORDAN MARSH
STATE OF FLORIDA

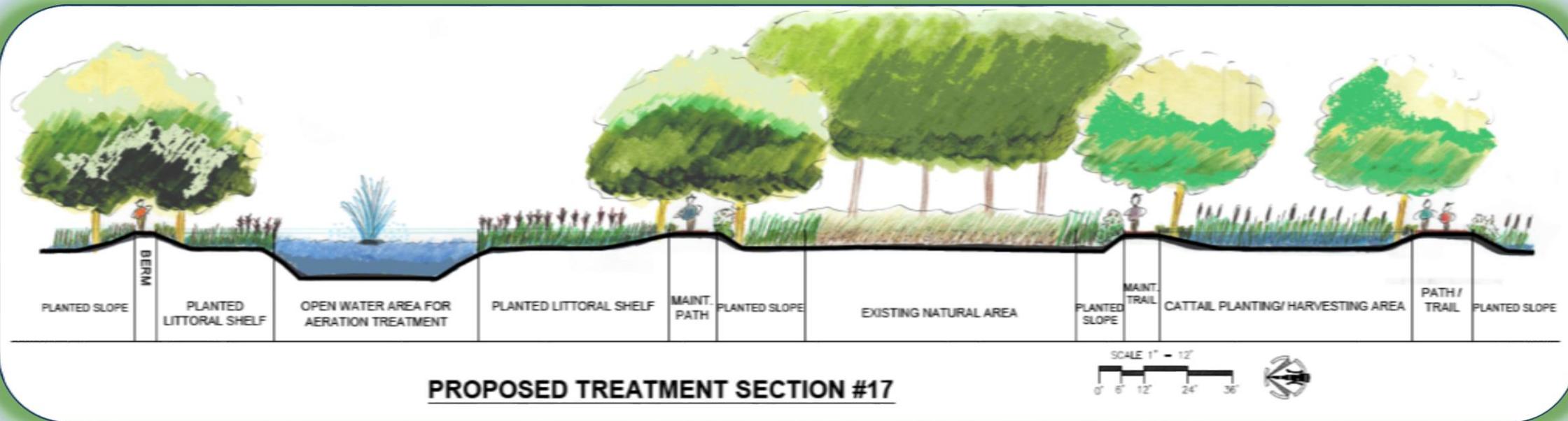
PROJECT NO.: 217025
PROJECT NAME: JORDAN MARSH
SHEET NO.: 1
DATE: JAP
DRAWN BY: JAP
CHECKED BY: GLE
CLIENT REVIEW:

ISSUE DATE:
REVISIONS:

DESIGN NAME:
JORDAN MARSH ILLUSTRATIVE LANDSCAPE PLAN
SHEET NUMBER:
L - 1.2

Landscape Plan

Proposed Treatment Section



Trees



Bald Cypress



Sabal Palm



Green
Buttonwood



Pond Apple



Gumbo Limbo



Sand Live Oak



Wild Tamarind



Carolina Willow



Silver Buttonwood

Shrubs



Florida Mayten



Marsh Elder



Cocoplum



Muhly Grass



Wax Myrtle



Jamacian Caper



Saw Palmetto



Coontie

Groundcovers



Cattails



Cordgrass



Bitter Panicum



Black Needle Rush



Sawgrass



Little Bluestem



Leather Fern



Giant Bulrush



Saltmeadow Cordgrass

Littorals



Gulfcoast Spikerush



Seashore Pasapalum



Pickerel Weed



Saltmarsh Bulrush

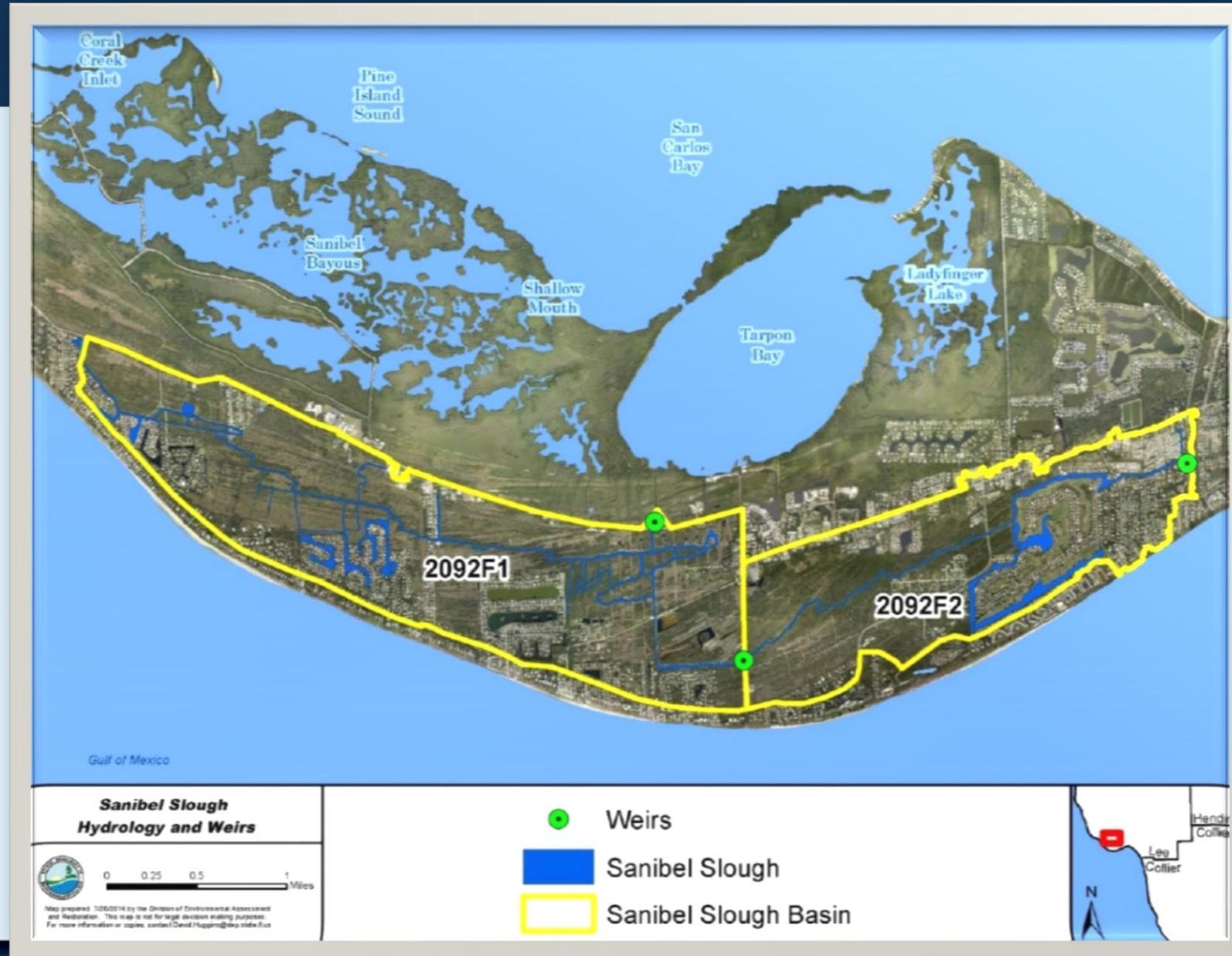


Seashore Saltgrass



Ducks Potato

Sanibel East & West Basins



Project Scope & Objectives

- **Scope:** *Design & permit a filter marsh at the subject site.*
- **Objectives:**
 - *To improve the water quality in the Sanibel Slough.*
 - *To meet the Total Maximum Daily Load (TMDL) requirements.*
 - *To enhance the existing wildlife habitat on the subject site.*
 - *To educate the park visitors on the Best Management Practices (BMPs) used in TMDL reduction.*

Residence Time for Various Flow Rates

Table 1: Residence Time for Various Flow Rates

Area (ft ²)	Depth (ft)	Volume (ft ³)	Q (cfs)	Q(ft/day)	Residence time (days)
160,000	3	480,000	0.5	43,200	11
			1	86,400	6
			1.5	129,600	4
			2	172,800	3
			3	259,200	2

TMDL Reduction Achieved

Table 2: Results of Simulation

Pumped into Jordan Marsh Q (cfs)	% of Original Concentration		% of Removed		Concentration in Sanibel Slough		Mass Removed (lbs/year)	
	TN	TP	TN	TP	TN (mg/l)	TP (mg/l)	TN	TP
2	85	66	15	34	1.9	0.13	1,119	174
1.5	81	57	19	43	1.9	0.13	1,063	165
1	73	43	27	57	1.9	0.13	1,007	145
0.5	54	19	46	81	1.9	0.13	858	103

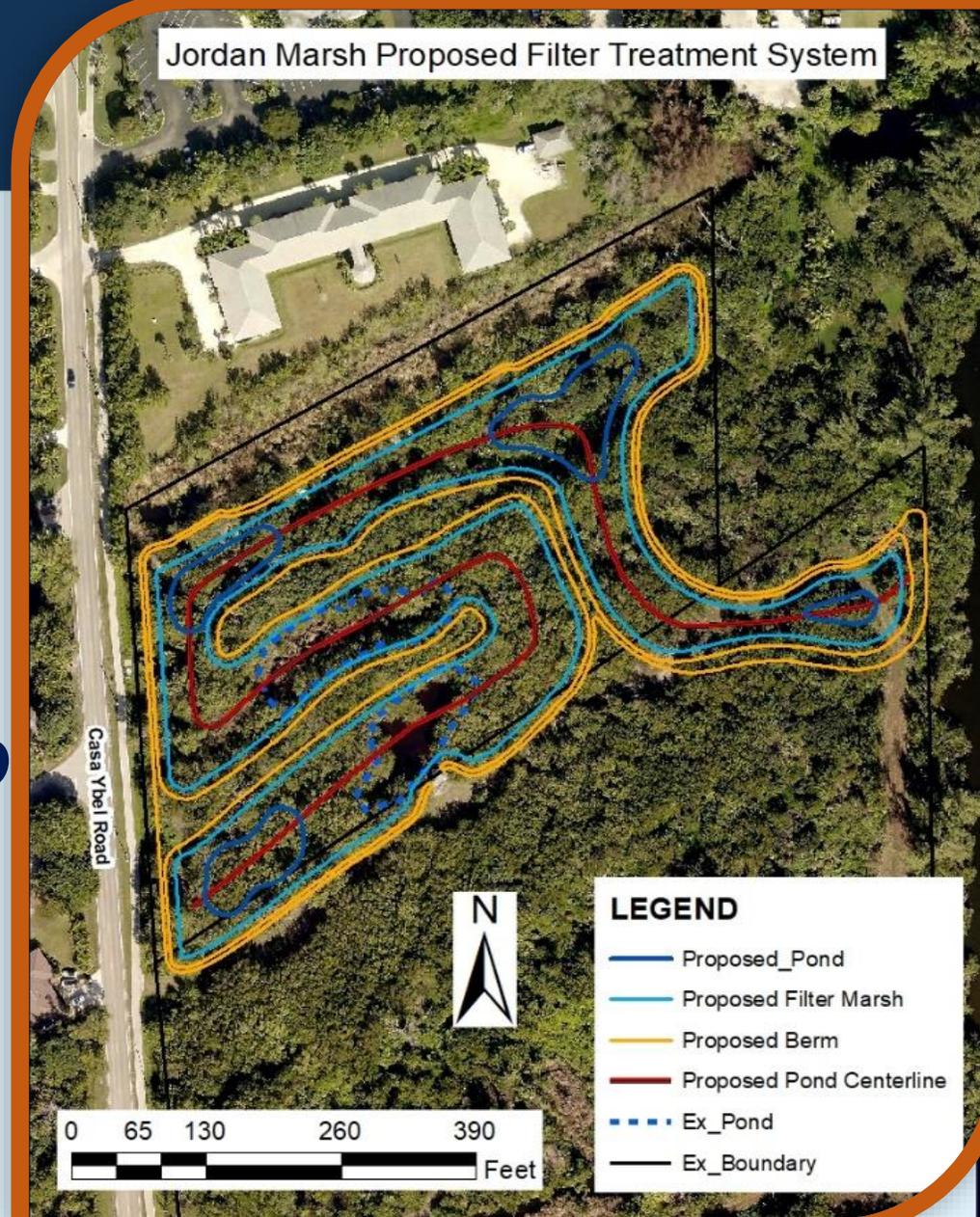
TMDL Reduction Achieved

Results of Simulation

Pumped into Jordan Marsh Q (cfs)	% of Original Concentration		% Removed		Concentration in Sanibel Slough		Load Treated by Jordan Marsh		% of Maximum Treated by Jordan Marsh	
	TN	TP	TN	TP	TN (mg/l)	TP (mg/l)	TN (lbs/Yr)	TP (lbs/Yr)	TN	TP
2	85	66	15	34	1.90	0.13	1,119	174	21%	16%
1.5	81	57	19	43	1.90	0.13	1,063	165	20%	16%
1	73	43	27	57	1.90	0.13	1,007	145	19%	14%
0.5	54	19	46	81	1.90	0.13	858	103	16%	10%

Hydraulics and Water Quality Model

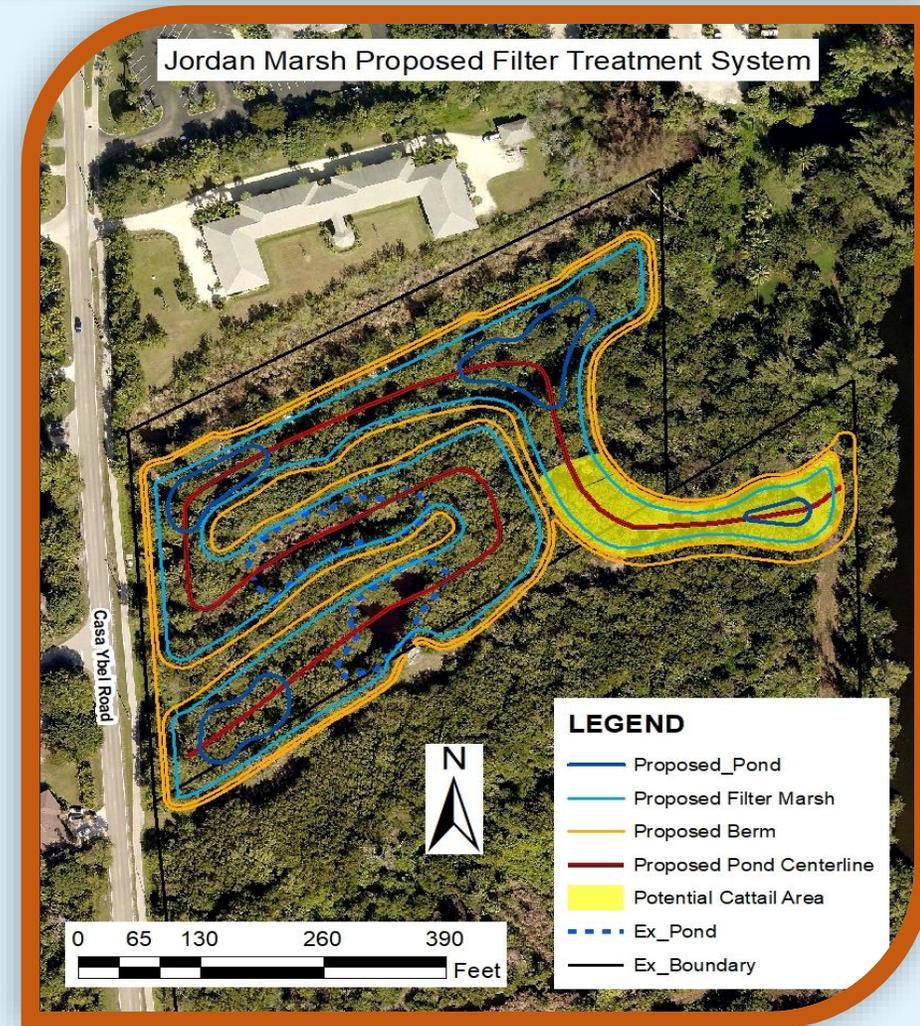
The EPA Storm Water Management Model Version 5.1 (SWMM5.1) hydraulics and water quality model was used to simulate flow conditions in the proposed marsh



Total Maximum Daily Load (TMDL) Reduction

Conclusions

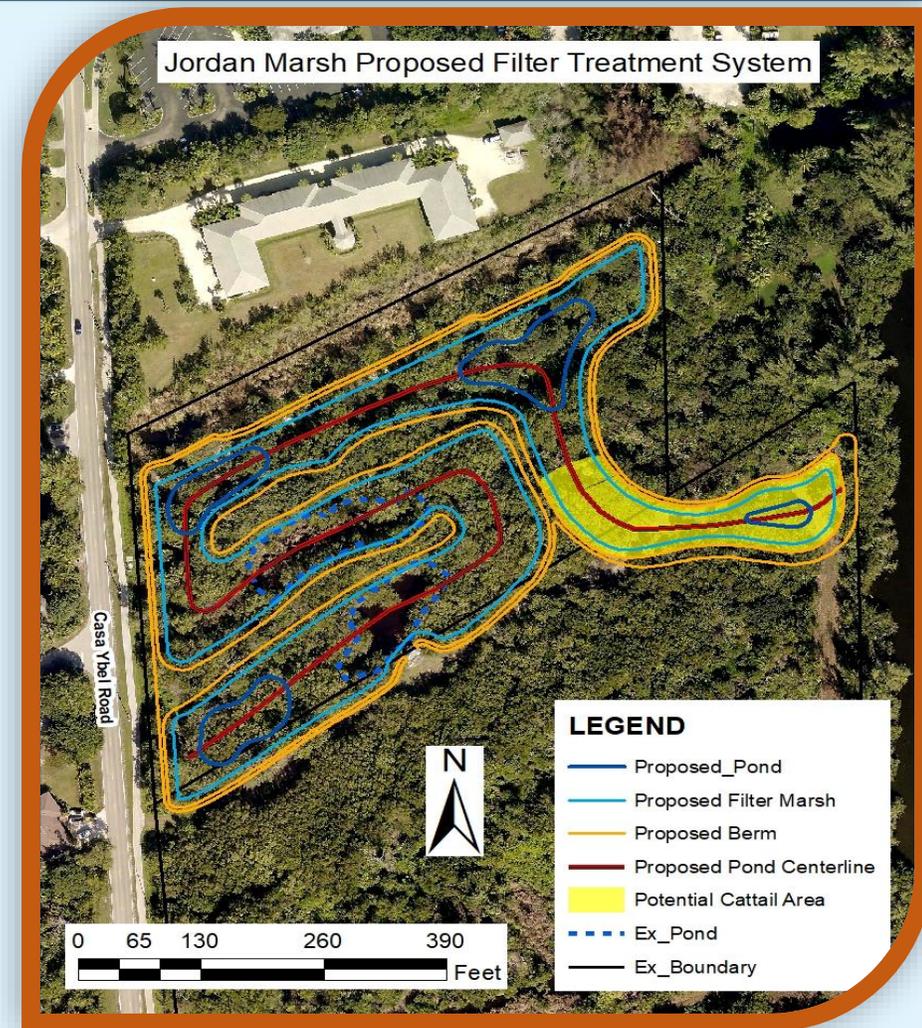
- The percentage removed for both TN and TP decreases with increasing flow rates.
- The highest percentage removal is for the 0.5 cfs with an 11 day residence time



Total Maximum Daily Load (TMDL) Reduction

Conclusions (continued)

- Higher flow rates will obviously reduce the residence time and consequently treatment will be more inefficient.
- However, higher flow, although not as efficient, will remove higher mass loads as shown in Table 2.



Next Steps

Permitting (12 – 16 Weeks)

100% Plans (4 – 6 Weeks)

Post Design (12 – 16 Weeks)



Public Comments & Recommendations

If you have any comments or recommendations, please contact *AIM Engineering & Surveying, Inc.* **by Tuesday October 17, 2017:**

AIM Engineering & Surveying, Inc.

Munir R. Al-Suleh, MSEE, PE

239-332-4569, Ex. 1019

mal-suleh@aimengr.com