

INDIAN RIVER COUNTY  
BOARD OF COUNTY COMMISSIONERS  
JUNGLE TRAIL

SHORELINE STABILIZATION PROJECT

PROJECT #I.R.C.-1823



PREPARED FOR:

INDIAN RIVER COUNTY DEPARTMENT OF  
PUBLIC WORKS ENGINEERING DIVISION 1801  
27TH STREET, VERO BEACH, FL. 32960  
ASSISTANT PUBLIC WORKS DIRECTOR: JAMES ENNIS, PMP, P.E.

PREPARED BY:

ENVIRONMENTAL SCIENCE ASSOCIATES  
4200 W. CYPRESS ST., SUITE 450  
TAMPA, FL 33607



Cover Sheet: C-101



**Know what's below.  
Call before you dig.**

ENGINEER OF RECORD:

  
BRYAN D. FLYNN  
FLORIDA P.E. NUMBER: 70856

Date: May 29, 2019

GENERAL NOTES

1. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF THE QUANTITIES OF WORK REQUIRED TO COMPLETE THE CONSTRUCTION SHOWN ON THE PLANS. THE CONTRACTOR SHALL ALSO MAKE THEIR OWN ASSESSMENT OF THE SITE AND THE WORK REQUIRED PRIOR TO BIDDING AND ANY DISCREPANCIES, ERRORS OR OMISSIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE THE BID DUE DATE. THE CONTRACTOR SHALL CHECK PLANS FOR CONFLICTS AND DISCREPANCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD OF ANY CONFLICT BEFORE PERFORMING ANY WORK IN THE AFFECTED AREA.
2. ALL EXCAVATION AND PLACEMENT MUST BE COMPLETED BY MECHANICAL METHODS AND FROM SHORE.
3. ALL CONSTRUCTION ACTIVITY WILL BE CONDUCTED DURING DAYLIGHT HOURS FROM ONE HALF-HOUR AFTER SUNRISE TO ONE HALF-HOUR BEFORE SUNSET.
4. ALL WORK WILL BE COMPLETED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
5. ALL WORK WILL BE COMPLETED WITHIN DESIGNATED AREAS AND TO DESIGNATED ELEVATIONS.
6. CONTRACTOR MUST INSTALL AND MAINTAIN A PROJECT SIGN, COUNTY TO PROVIDE TEMPLATE.
7. CONTRACTOR MUST OBSERVE A 3 FOOT BUFFER FROM ANY SUBMERGED AQUATIC VEGETATION (SAV). NO CONSTRUCTION ACTIVITY, MATERIALS, OR TEMPORARY TURBIDITY MEASURES WILL BE ALLOWED WITHIN 3 FEET OF SAV.
8. THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THE WORK IN SUCH MANNER AS TO NOT OBSTRUCT INDIAN RIVER COUNTY OPERATIONS. CONTRACTOR SHALL MAKE REASONABLE EFFORTS TO AFFORD A PRACTICABLE AND SAFE MAINTENANCE OF TRAFFIC ALONG JUNGLE TRAIL. UPON THE COMPLETION OF THE WORK EACH DAY THE CONTRACTOR SHALL PROMPTLY REMOVE THE EQUIPMENT, ETC. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR ALL EQUIPMENT INGRESS AND EGRESS TO AND FROM THE PROJECT WORK AREAS. THE CONTRACTOR SHALL MAKE AN INVESTIGATION OF ACCESS ROUTES AND THE ROADS FOR TRANSPORTATION, LOAD LIMITS FOR BRIDGES AND ROADS, AND OTHER ROAD CONDITIONS AFFECTING THE TRANSPORTATION OF MATERIALS AND EQUIPMENT TO THE WORK SITES. THE CONTRACTOR SHALL ALSO INVESTIGATE THE AVAILABILITY OF ANY STAGING, STORAGE, AND STOCK PILING AREAS AND SHALL MAKE ALL ARRANGEMENTS FOR USE OF ANY SUCH AREAS FOR THE DELIVERY OF ANY MATERIALS AND EQUIPMENT TO BE USED IN COMPLETING THE WORK.
9. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UNDERGROUND UTILITIES OR OTHER OBJECTS PRIOR TO COMMENCING WORK AT THE SITE. CONTACT "SUNSHINE" AT 1-800-432-4770.
10. ALL AREAS OR ITEMS THAT ARE DAMAGED OR DISTURBED ABOVE OR BELOW GROUND BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL OR BETTER CONDITION AT NO COST TO THE COUNTY. REPAIR AND REPLACEMENT OF ALL PRIVATE AND PUBLIC PROPERTY AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION OF EQUAL TO, OR BETTER THAN EXISTING CONDITIONS UNLESS SPECIFICALLY EXEMPTED BY THE PLANS.
11. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING HORIZONTAL AND VERTICAL ACCURACY DURING EXCAVATION.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE PERMIT AND INSPECTION REQUIREMENTS OF THE VARIOUS GOVERNMENTAL AGENCIES. ALL WORK PERFORMED SHALL COMPLY WITH THE REGULATIONS AND ORDINANCES OF THE VARIOUS GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER THE WORK.
13. CONSTRUCTION TRAFFIC SHALL NOT IMPEDE THE SAFE AND EFFICIENT USE OF SURROUNDING ROADWAYS. CONTRACTOR SHALL FOLLOW FOOT STANDARD INDICES 600 AND 604 FOR MAINTENANCE OF TRAFFIC DURING CONSTRUCTION OF THE TEMPORARY CONSTRUCTION ACCESS CONNECTION.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY REMOVAL OF ANY FLIGHTY DUST, SAND OR DEBRIS WHICH MAY BE CAUSED BY THEIR ACTIONS FROM THE RIGHT OF WAY.
15. CONTRACTOR SHALL ISSUE NOTICE TO MARINERS OFFICE ESTABLISH A TEMPORARY "NO WAKE ZONE" WITH US COAST GUARD, AND INDIAN RIVER COUNTY SHERIFF'S OFFICE MARINE UNIT DURING CONSTRUCTION.
16. REPORT SUBMISSION: THE CONTRACTOR SHALL MAINTAIN A LOG DETAILING DAILY CONSTRUCTION ACTIVITY DURING THE CONTRACT PERIOD. THE DATA SHALL BE RECORDED ON FORMS PROVIDED BY THE COUNTY/ENGINEER. ALL DATA IN ORIGINAL FORM SHALL BE FORWARDED DIRECTLY TO THE COUNTY/ENGINEER, WITHIN 10 DAYS OF COLLECTION AND COPIES OF THE DATA SHALL BE SUPPLIED TO THE COUNTY/ENGINEER, FOLLOWING PROJECT COMPLETION. A REPORT SUMMARIZING THE ABOVE INCIDENTS AND SIGHTINGS SHALL BE SUBMITTED TO THE COUNTY.

SURVEY NOTES

1. HYDROGRAPHIC AND TOPOGRAPHIC SURVEY PERFORMED BY MORGAN & EKLUND, INC.
2. VERTICAL DATUM SHOWN IS BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. HORIZONTAL DATUM SHOWN IS BASED ON FLORIDA EAST ZONE STATE PLANE COORDINATES, NORTH AMERICAN DATUM 1983 (NAD83). ALL ELEVATIONS ARE REPORTED IN U.S. FEET.
4. AERIAL PHOTOGRAPHY PROVIDED BY FLORIDA DEPARTMENT OF TRANSPORTATION, 2015.
5. DRAWINGS REPRESENT CONDITIONS ENCOUNTERED AT TIME OF SURVEY. SITE CONDITIONS ARE DYNAMIC AND SUBJECT TO CHANGE. CONTRACTOR SHALL CONDUCT SURVEY PRIOR TO SITE DISTURBANCE TO VERIFY SITE CONDITIONS PRIOR TO CONSTRUCTION.
6. THE COUNTY HAS PERFORMED A FEASIBILITY LEVEL SURVEY THAT IS INCLUDED IN THE CONTRACT DRAWINGS. THIS PRE-EXCAVATION SURVEY WAS USED TO CALCULATE AN ESTIMATED QUANTITY OF MATERIAL TO BE EXCAVATED. THIS QUANTITY IS CONSIDERED AN ESTIMATE AND IS NOT THE BASIS FOR PAYMENT TO THE CONTRACTOR. PAYMENT FOR THIS WORK SHALL NOT BE BASED ON THE VOLUME OF MATERIAL (CUBIC YARDS) PLACED AT THE WORK AREA. THE CONTRACTOR SHALL BE COMPENSATED SOLELY BASED ON THE LUMP SUM BID PRICE. CONTRACTOR SHALL MAKE AN ASSESSMENT OF THIS AND ANY OTHER RELEVANT INFORMATION NECESSARY IN THE JUDGMENT OF THE CONTRACTOR, IN DETERMINING THE EXPECTED VOLUME TO BE REMOVED/ADDED.
6. CONTRACTOR WILL BE RESPONSIBLE FOR AS-BUILT SURVEY PRIOR TO FINAL COMPLETION OF WORK.

ENVIRONMENTAL PROTECTION NOTES

1. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION CONDITIONS FOR PROTECTION OF MANATEES, SEA TURTLES AND SMALLTOOTH SAWFISH:
  - 1.1. THE CONTRACTOR SHALL INSTRUCT ALL PERSONNEL ASSOCIATED WITH THE PROJECT OF THE POTENTIAL PRESENCE OF THESE SPECIES AND THE NEED TO AVOID COLLISIONS WITH MANATEES, SEA TURTLES AND SMALLTOOTH SAWFISH. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF THESE SPECIES.
  - 1.2. THE CONTRACTOR SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING MANATEES, SEA TURTLES OR SMALLTOOTH SAWFISH, WHICH ARE PROTECTED UNDER THE ENDANGERED SPECIES ACT OF 1973.
  - 1.3. TYPE II TURBIDITY BARRIERS SHALL BE MADE OF MATERIAL IN WHICH A MANATEE, SEA TURTLE OR SMALLTOOTH SAWFISH CANNOT BECOME ENANGLED. SILTATION BARRIERS SHALL BE PROPERLY SECURED AND REGULARLY MONITORED TO AVOID PROTECTED SPECIES ENTRAPMENT. BARRIERS MAY NOT BLOCK MANATEE, SEA TURTLE OR SMALLTOOTH SAWFISH ENTRY TO OR EXIT FROM DESIGNATED CRITICAL HABITAT WITHOUT PRIOR AGREEMENT FROM THE NATIONAL MARINE FISHERIES SERVICES PROTECTED RESOURCES DIVISION, ST. PETERSBURG, FLORIDA.
  - 1.4. TYPE II TURBIDITY BARRIERS, STAKES, ROPES AND/OR ANCHORS MUST REMAIN 3 FEET FROM ANY SUBMERGED AQUATIC VEGETATION.
  - 1.5. ALL VESSELS 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.
  - 1.6. IF A MANATEE, SEA TURTLE OR SMALLTOOTH SAWFISH IS SIGHTED WITHIN 100 YARDS OF THE ACTIVE DAILY CONSTRUCTION OPERATION OR VESSEL MOVEMENT, ALL APPROPRIATE PRECAUTIONS SHALL BE IMPLEMENTED BY THE CONTRACTOR TO ENSURE ITS PROTECTION. THESE PRECAUTIONS SHALL INCLUDE CESSATION OF OPERATION OF ANY MOVING EQUIPMENT CLOSER THAN 50 FEET OF A MANATEE, SEA TURTLE OR SMALLTOOTH SAWFISH. OPERATION OF ANY MECHANICAL CONSTRUCTION EQUIPMENT SHALL CEASE IMMEDIATELY IF A MANATEE, 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.
  - 1.7. ANY COLLISION WITH AND/OR INJURY TO A MANATEE, SEA TURTLE OR SMALLTOOTH SAWFISH SHALL BE REPORTED IMMEDIATELY TO THE OWNER/ENGINEER AND TO THE NATIONAL MARINE FISHERIES PROTECTED RESOURCES DIVISION (727-824-5312) AND TO THE LOCAL AUTHORIZED SEA TURTLE STRANDING/RESCUE ORGANIZATION.
2. CONTRACTOR SHALL NOT OCCUPY PRIVATE LAND OUTSIDE OF ANY EASEMENTS OR RIGHTS OF WAY.
3. MATERIAL REMOVED FROM BEYOND THE CONSTRUCTION LIMITS AS SPECIFIED ON THE CONTRACT DRAWINGS SHALL BE CONSIDERED EXCESSIVE EXCAVATION FOR WHICH PAYMENT WILL NOT BE MADE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEDERAL, STATE, AND LOCAL REGULATORY PERMITS, IMPLICATIONS, VIOLATIONS AND/OR FEES AS A RESULT OF EXCESSIVE EXCAVATION.
4. IF ARCHEOLOGICAL OR HISTORIC RESOURCES ARE ENCOUNTERED THE CONTRACTOR SHALL NOTIFY THE COUNTY/ENGINEER IMMEDIATELY AND STOP WORK UNTIL DIRECTED TO RESTART.
5. THE CONTRACTOR SHALL STRICTLY ADHERE TO ALL MANATEE REGULATIONS FOR IN WATER WORK.
6. TURBIDITY CONTROL MEASURES WILL BE PROPERLY MAINTAINED IN COMPLIANCE WITH FEDERAL AND STATE WATER QUALITY STANDARDS. IF TURBIDITY LEVELS EXCEED WATER QUALITY STANDARDS, CONSTRUCTION ACTIVITY WILL CEASE UNTIL LEVELS RETURN TO THE ACCEPTABLE RANGE. WATER QUALITY WILL BE MONITORED BY THE COUNTY'S REPRESENTATIVE. SHOULD TURBIDITY BE MEASURED MORE THAN 29 NTUS ABOVE BACKGROUND, WORK WILL CEASE UNTIL TURBIDITY HAS FALLEN TO AN ACCEPTABLE BACKGROUND LEVEL.
7. BEST MANAGEMENT PRACTICES FOR EROSION AND TURBIDITY CONTROL, INCLUDING BUT NOT LIMITED TO THE USE OF STAKED HAY BALES, TURBIDITY BARRIERS, AND SILT SCREENS, SHALL BE USED AND MAINTAINED AS NECESSARY AT ALL TIMES DURING THE PROJECT. TURBIDITY CONTROL DEVICES SHALL BE MAINTAINED AND SHALL REMAIN IN PLACE DURING ACTIVE CONSTRUCTION TO ENSURE THAT TURBIDITY LEVELS OUTSIDE THE CONSTRUCTION AREA DO NOT EXCEED BACKGROUND LEVELS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT TURBIDITY CONTROL DEVICES ARE INSPECTED, DEPLOYED AND RETRIEVED DAILY AND MAINTAINED IN GOOD WORKING ORDER SO THAT THERE ARE NO VIOLATIONS OF STATE WATER QUALITY STANDARDS OUTSIDE OF THE TURBIDITY SCREENS. TURBIDITY BARRIERS SHALL ENCOMPASS THE WORK AREA AND BE MOVED AS SECTION ARE COMPLETED.
8. A DAILY TURBIDITY LOG SHALL BE MAINTAINED BY THE COUNTY WITH ENTRIES PRIOR TO THE START OF EACH DAY'S WORK, EACH HOUR THROUGHOUT THE DAY, AND 30 MINUTES PRIOR TO THE END OF WORK. THE COUNTY REPRESENTATIVE WILL EVALUATE THE IMPLEMENTATION, DEPLOYMENT, AND EFFECTIVENESS OF SITUATION/TURBIDITY CONTROL DEVICES.
9. THE CONTRACTOR SHALL DISTURB NO MORE GROUND THAN WHAT IS NECESSARY FOR CONSTRUCTION. NO OPEN EXCAVATED TRENCH, OR OTHER UNSAFE CONDITION, WILL BE LEFT OVERNIGHT. THE CONTRACTOR SHALL ONLY GRADE AND PLACE RIP RAP AND GEOTEXTILE MATERIAL IN AN AREA THAT CAN BE COMPLETED IN ONE WORK DAY. THE INTENT OF THIS PROVISION IS TO "SAFE UP" THE PROJECT SITE AS WORK PROGRESSES, AND SHALL INCLUDE FILLING HOLES, GRADING, AND REMOVAL OF DEBRIS.
10. ALL SIDEWALK DAMAGED BY THE CONTRACTOR OR SUBCONTRACTORS SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR, AT THE DIRECTION OF THE ENGINEER.
11. THE COUNTY WILL STAKE THE LIMITS OF THE PROJECT AND FLAG MANGROVES TO REMAIN. FIELD ADJUSTMENTS FOR MANGROVE REMOVAL SHOULD BE EXPECTED. LATERAL TRIMMING OF MANGROVE BRANCHES IS PREFERRED TO ENTIRE TREE REMOVAL TO THE GREATEST EXTENT POSSIBLE.

CONSTRUCTION NOTES

1. ALL STONE SHALL BE HARD, DURABLE QUALITY STONE SUCH THAT IT WILL NOT DISINTEGRATE UNDER THE ELEMENTS AND IT WILL NOT BREAK UNDER HANDLING. ALL STONE SHALL BE CLEAN AND FREE FROM EARTH, DUST, OR OTHER REFUSE.
2. ARMOR STONE (RIP-RAP) SHALL PASS A "DROP TEST" AT THE QUARRY WITNESSED BY THE ENGINEER OR ENGINEER'S REPRESENTATIVE PRIOR TO TRANSPORTING THE FIRST TRUCKLOADS OF ARMOR STONE TO THE PROJECT SITE.
3. THE FACES OF INDIVIDUAL PIECES OF STONE SHALL BE ROUGHLY ANGULAR, NOT ROUNDED, IN SHAPE. THE LEAST DIMENSION OF EACH STONE SHALL NOT BE LESS THAN ONE-THIRD (1/3) OF THE GREATEST DIMENSION OF THAT STONE.
4. THE STONES SHALL BE PLACED/CHUNKED IN SUCH A MANNER THAT THEY WILL BE PROPERLY INTERLOCKED WITH THE UNDERLIEING OR ADJACENT STONES TO RESIST DISPLACEMENT BY WAVE ACTION AND FORM A UNIFORM AND COMPACT SECTION. EACH STONE SHALL BE FINALLY SET AND WELL-SUPPORTED BY UNDERLYING AND ADJACENT STONE WITH A MINIMUM OF 4 POINTS OF CONTACT. NO STONES SHOULD BE LESS THAN 1 FOOT IN DIAMETER ON THE SURFACE OF THE STRUCTURE.
5. ARMOR STONE (RIP-RAP) SHALL BE UP TO 2.5 FEET IN DIAMETER SIZE Limestone (OR AS OTHERWISE APPROVED BY THE ENGINEER) AND SHALL HAVE A MINIMUM UNIT WEIGHT OF 140 PCF.
6. ARMOR STONE SHALL CONSIST OF SOUND, HARD, DURABLE RUBBLE, FREE OF OPEN OR INCIPENT CRACKS, SOFT SEAMS, OR OTHER STRUCTURAL DEFECTS, CONSISTING OF BROKEN STONE WITH A BULK SPECIFIC GRAVITY OF AT LEAST 2.30. ENSURE THAT STONES ARE ROUGH AND ANGULAR WITH A MAXIMUM DIAMETER OF 2.5 FEET (UNLESS OTHERWISE SPECIFIED). FOR THIS APPLICATION, USE BROKEN STONE MEETING THE FOLLOWING GRADATION AND THICKNESS REQUIREMENTS:

WEIGHT MAXIMUM (POUNDS)	WEIGHT 50% (POUNDS)	WEIGHT MINIMUM (POUNDS)	MINIMUM BLANKET THICKNESS (FEET)
700	450	250	2.0
7. ENSURE THAT AT LEAST 97% OF THE MATERIAL BY WEIGHT IS SMALLER THAN MAXIMUM POUNDS. ENSURE THAT AT LEAST 50% OF THE MATERIAL BY WEIGHT IS GREATER THAN WEIGHT 50% POUNDS. ENSURE THAT AT LEAST 85% OF THE MATERIAL BY WEIGHT IS GREATER THAN WEIGHT MINIMUM POUNDS.
8. BEDDING STONE SHALL CONSIST OF SOUND, HARD, DURABLE RUBBLE, FREE OF OPEN OR INCIPENT CRACKS, SOFT SEAMS, OR OTHER STRUCTURAL DEFECTS, CONSISTING OF BROKEN STONE WITH A BULK SPECIFIC GRAVITY OF AT LEAST 2.30. ENSURE THAT STONES ARE ROUGH AND ANGULAR WITH A MINIMUM DIAMETER OF 3 INCHES AND A MAXIMUM DIAMETER OF 6 INCHES (UNLESS OTHERWISE SPECIFIED). BEDDING STONE WILL BE PLACED ON TOP OF THE GEOTEXTILE MATERIAL, 6 INCHES THICK.
9. EXCAVATED MATERIAL WILL BE THE PROPERTY OF THE COUNTY UNLESS OTHERWISE NOTED BY THE CONTRACTOR. THEN IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND DISPOSE OF PROPERLY. EXCAVATION SHALL NOT EXCEED THE EXTENTS AND ELEVATIONS SHOWN ON THE DRAWINGS.
10. GEOTEXTILE MATERIAL WHICH IS Laid UNDER THE BEDDING STONE AND RIP RAP SHALL MEET FOOT SECTION 985 FOR GEOSYNTHETIC MATERIALS, GEOTEXTILE GROUP #4, OR EQUAL AND INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS MAKING SURE TO TRENCH IN THE MATERIAL AT THE TOP AND TOE OF SLOPE AND PROVIDE PROPER OVERLAP.
11. EROSION CONTROL BLANKET (NORTH AMERICAN GREEN Eriogon SC-150, OR EQUAL) SHALL BE APPLIED TO SLOPED SECTION AFTER FILL IS COMPACTED TO 95% MODIFIED PROCTOR DENSITY PER ASTM D-1585. EROSION CONTROL BLANKET SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS WITH PROPER TRENCHING, OVERLAP AND STAKING. STAKING ALONG THE BOTTOM OF THE SLOPE SHALL BE DOUBLED. JERSEY BARRIER THAT IS CURRENTLY INSTALLED ONSITE MAY BE UTILIZED BY THE CONTRACTOR DURING CONSTRUCTION AND DELIVERED TO THE COUNTY YARD AT THE END OF THE PROJECT.

OFF-SITE DISPOSAL NOTES

1. DEBRIS, SUCH AS STUMPS, ROCK FRAGMENTS, ROOTS, LOGS, TRASH, VEGETATION, FILTER FABRIC, ETC., AND ANY OTHER OBJECTS EXCEPT ARCHEOLOGICAL OR HISTORIC RESOURCES THAT EXIST WITHIN THE PROJECT AREA OR ARE UNEARTHED DURING OPERATIONS, SHALL BE REMOVED, TRANSPORTED, AND DISPOSED OF AT THE COUNTY LANDFILL AND SHOULD BE EXPECTED TO BE ENCOUNTERED DURING THE OPERATIONS AND WILL NOT CONSTITUTE A CHANGE OF CONDITION TO THE CONTRACT/LARGEMENT. REMOVAL AND DISPOSAL OF DEBRIS WILL TO BE SOLE RESPONSIBILITY OF THE CONTRACTOR IN ITS ENTIRETY. REMOVAL AND DISPOSAL OF DEBRIS AND OBSTRUCTIONS SHALL NOT BE PROVIDED FOR SEPARATELY FOR PAYMENT. ALL COSTS ASSOCIATED WITH THE REQUIRED DISPOSAL OF DEBRIS SHALL BE INCLUDED IN THE CONTRACT PRICE. THESE SPECIFICATIONS ARE NOT AN ALL-INCLUSIVE REFERENCE OF DEBRIS TYPES, WHICH MAY BE ENCOUNTERED. IT IS ANTICIPATED THAT DURING CLEARING/CONSTRUCTION ACTIVITY DEBRIS (INCLUDED BUT NOT LIMITED TO VEGETATION, TREES, ROOTS, ROCKS, BEDROCK, FILTER FABRIC, CONCRETE, ASPHALT, WOOD, TRASH, GARBAGE, UNSUITABLE SOIL, METAL, ETC.) WILL BE ENCOUNTERED. THE CONTRACTOR SHALL BE PREPARED AND RESPONSIBLE FOR PROPER REMOVAL AND DISPOSAL.
2. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MATERIALS OFFSITE. (I.E. DESIGNATED VEGETATION, FILTER FABRIC, SILT FENCE, TRASH, DEBRIS, ETC.).

TIDE DATUM TABLE

1. TIDAL DATUM DATA OBTAINED FROM THE WABASSO, INDIAN RIVER TIDE STATION, STATION NO. 8722059

DATUM	ELEVATION (FT NAVD88)
NAVD88	0
MHHW	-0.66
MHW	-0.72
MSL	-0.91
MLOW	-1.09
MLW	-1.14

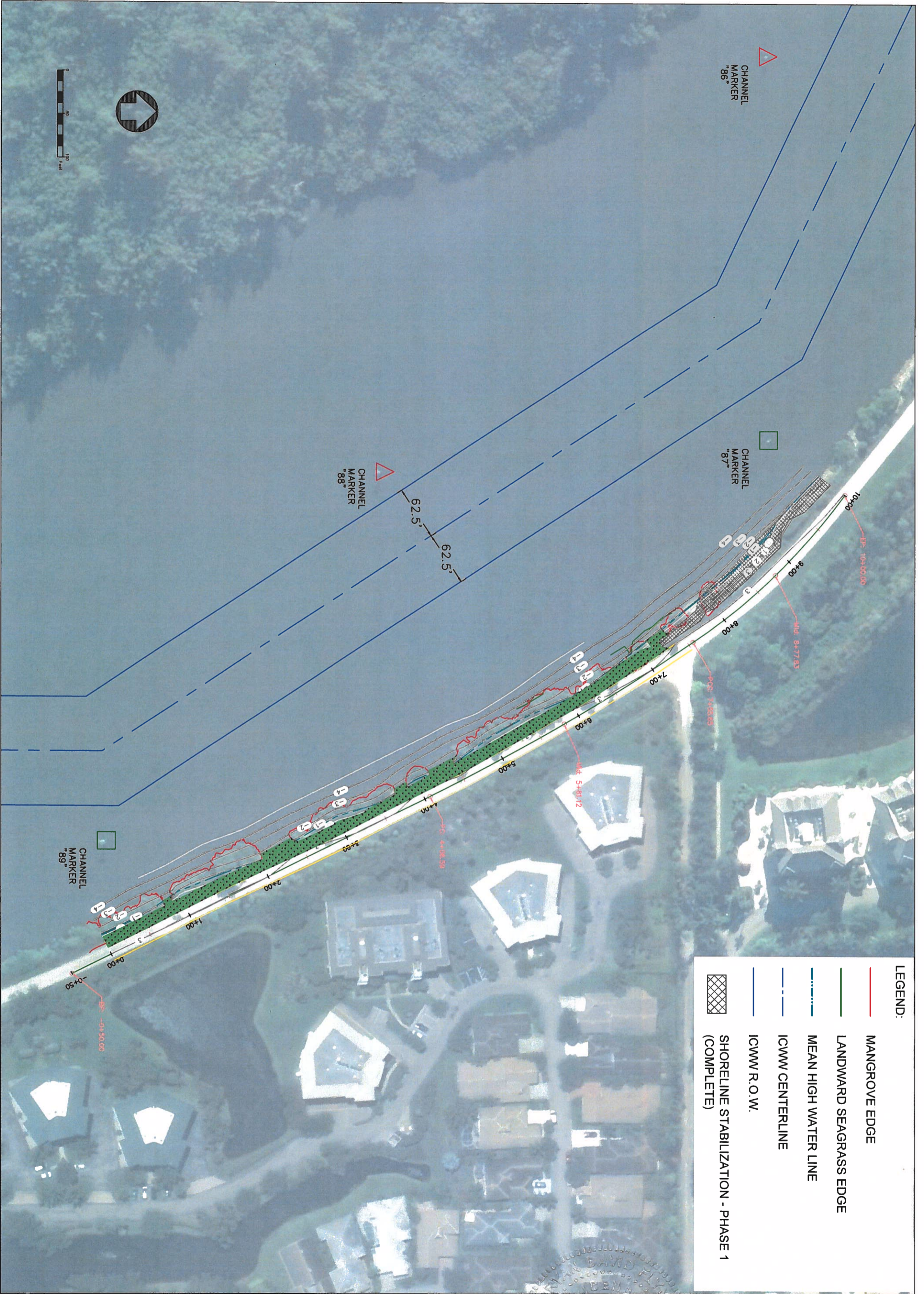


4200 WEST CYPRESS ST., STE. 450  
TAMPA, FL 33607  
OFFICE - 813.207.7200  
WWW.ESASSOC.COM

REVISIONS		BY		DATE
NO.	DATE	BY	DATE	
DESIGNED:	BOF	5/29/19		
DRAWN:	BOF	5/29/19		
CHECKED:	TJR	5/29/19		
APPROVED:	RTB	5/29/19		

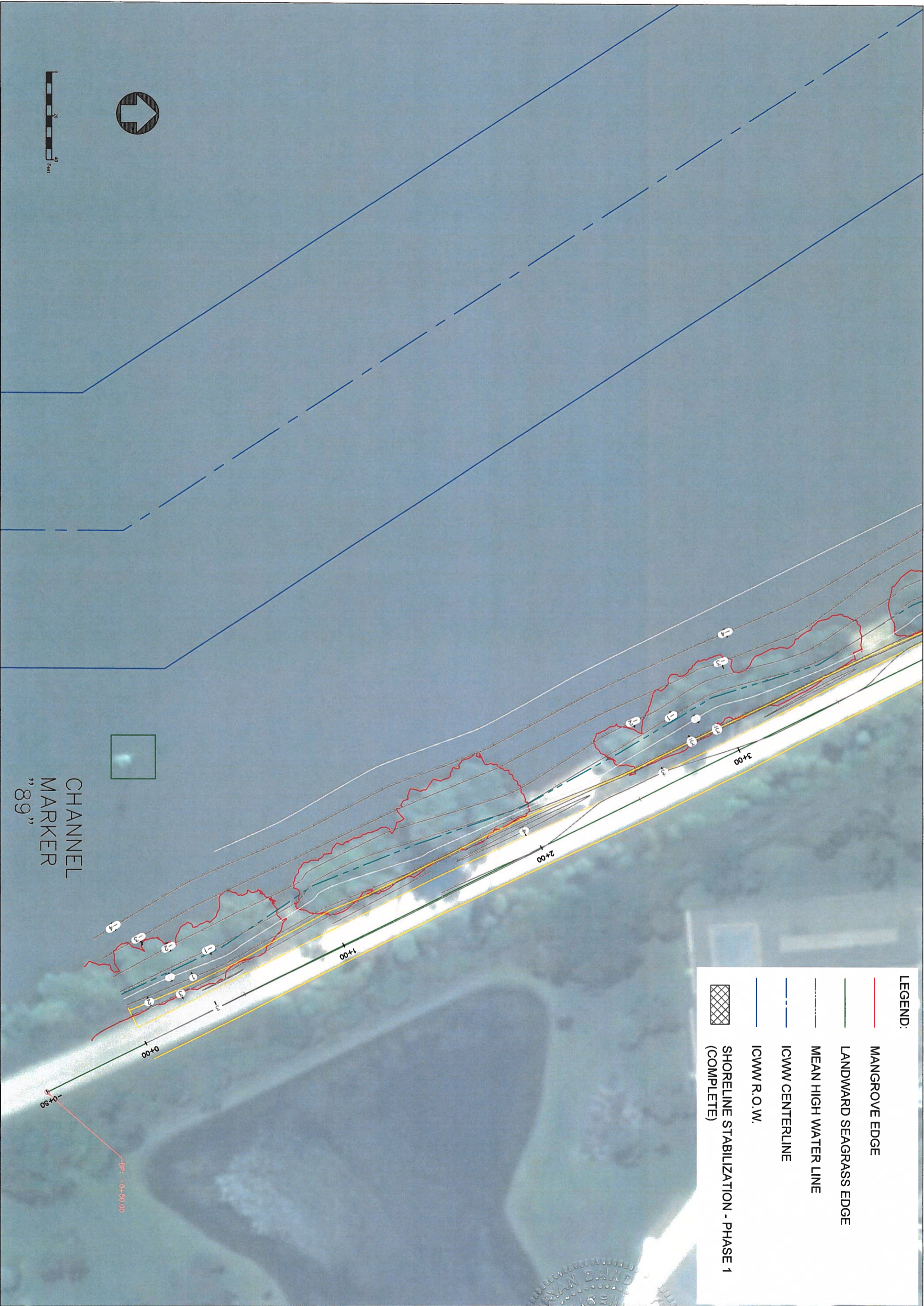
INDIAN RIVER COUNTY  
1801 27TH STREET  
VERO BEACH, FL 32960

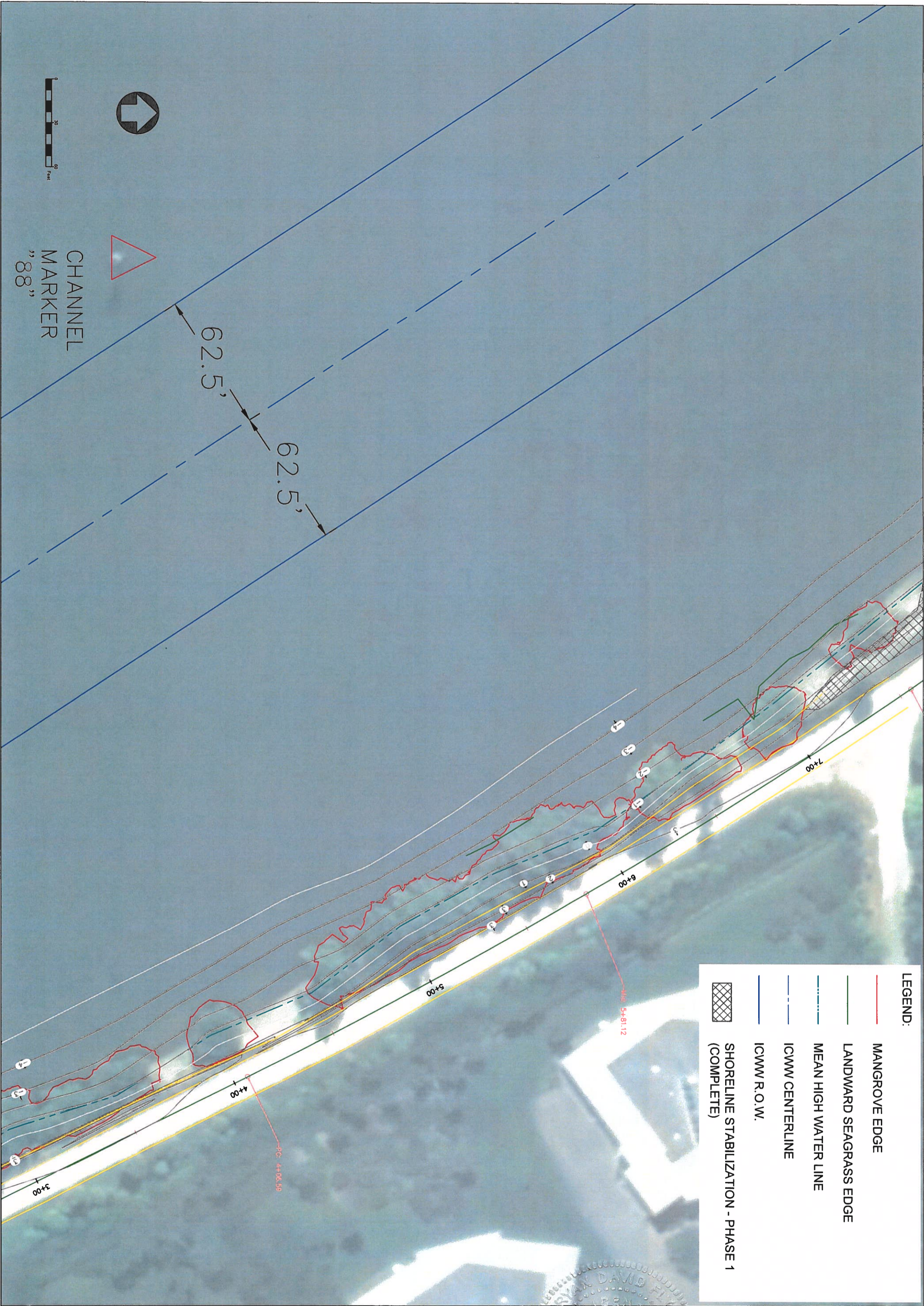
JUNGLE TRAIL  
SHORELINE STABILIZATION PROJECT  
WABASSO, FL  
GENERAL NOTES



**LEGEND:**

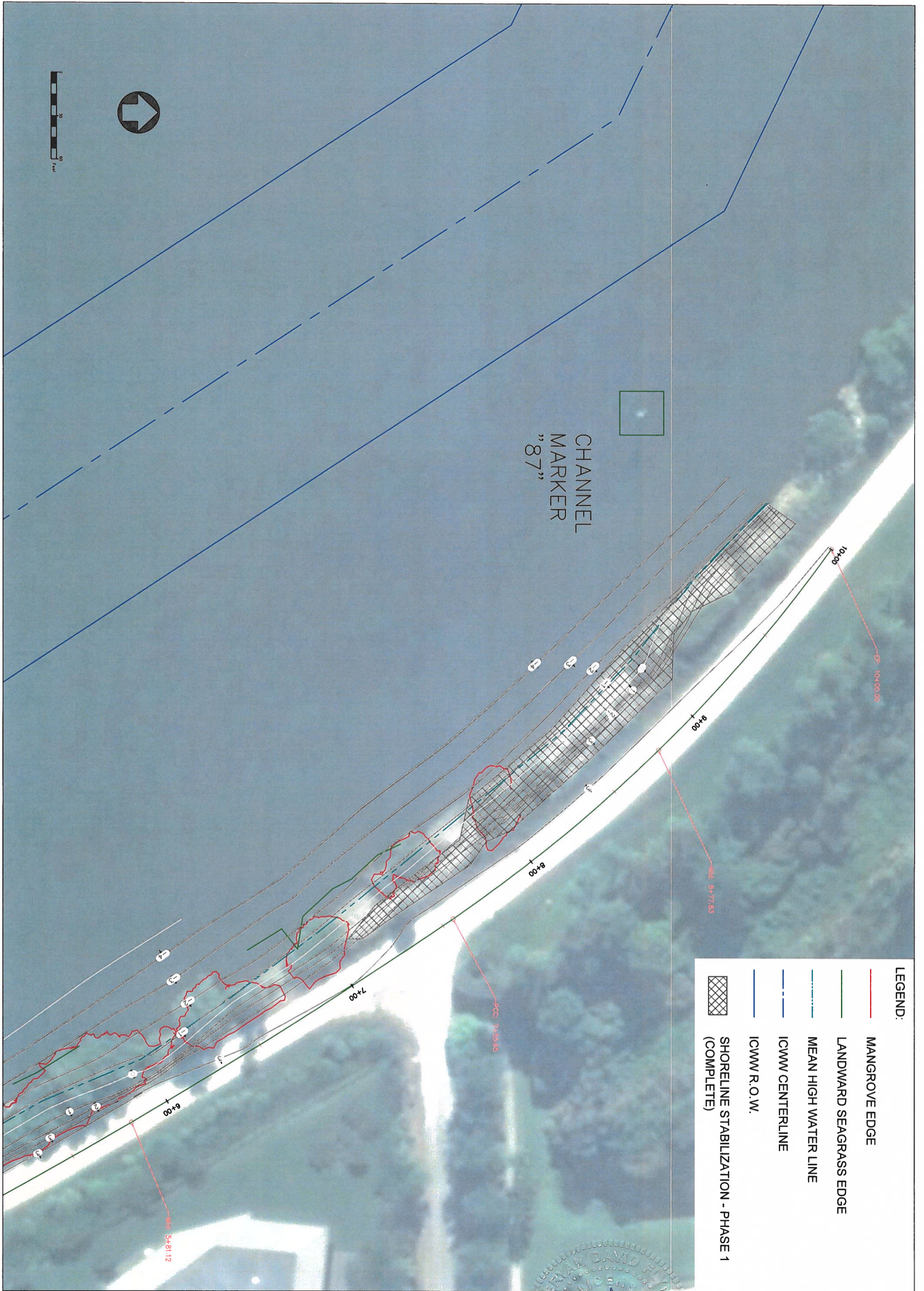
	MANGROVE EDGE
	LANDWARD SEAGRASS EDGE
	MEAN HIGH WATER LINE
	ICWW CENTERLINE
	ICWW R.O.W.
	SHORELINE STABILIZATION - PHASE 1 (COMPLETE)





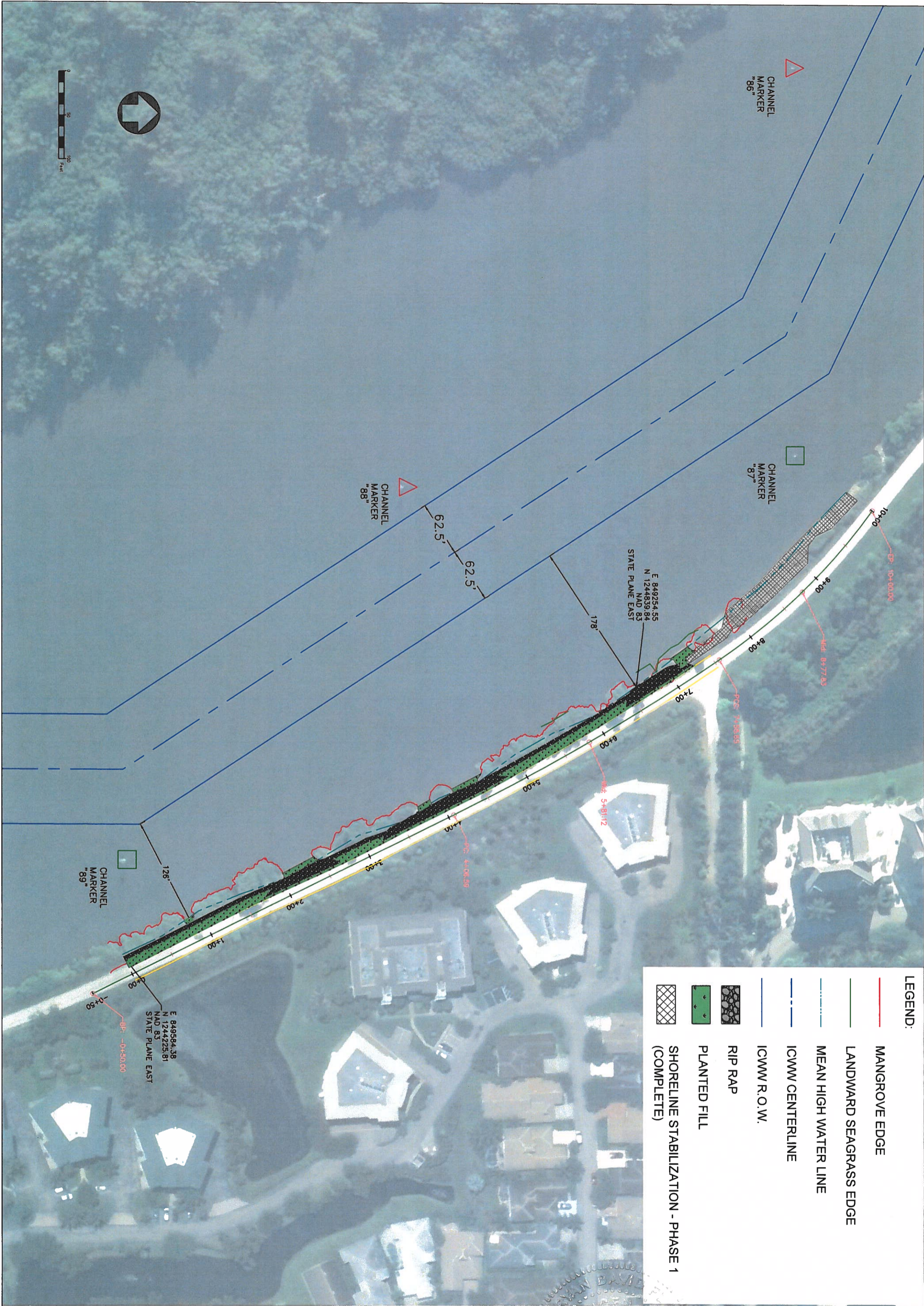
**LEGEND:**

- MANGROVE EDGE
- LANDWARD SEAGRASS EDGE
- MEAN HIGH WATER LINE
- ICWW CENTERLINE
- ICWW R.O.W.
- SHORELINE STABILIZATION - PHASE 1 (COMPLETE)

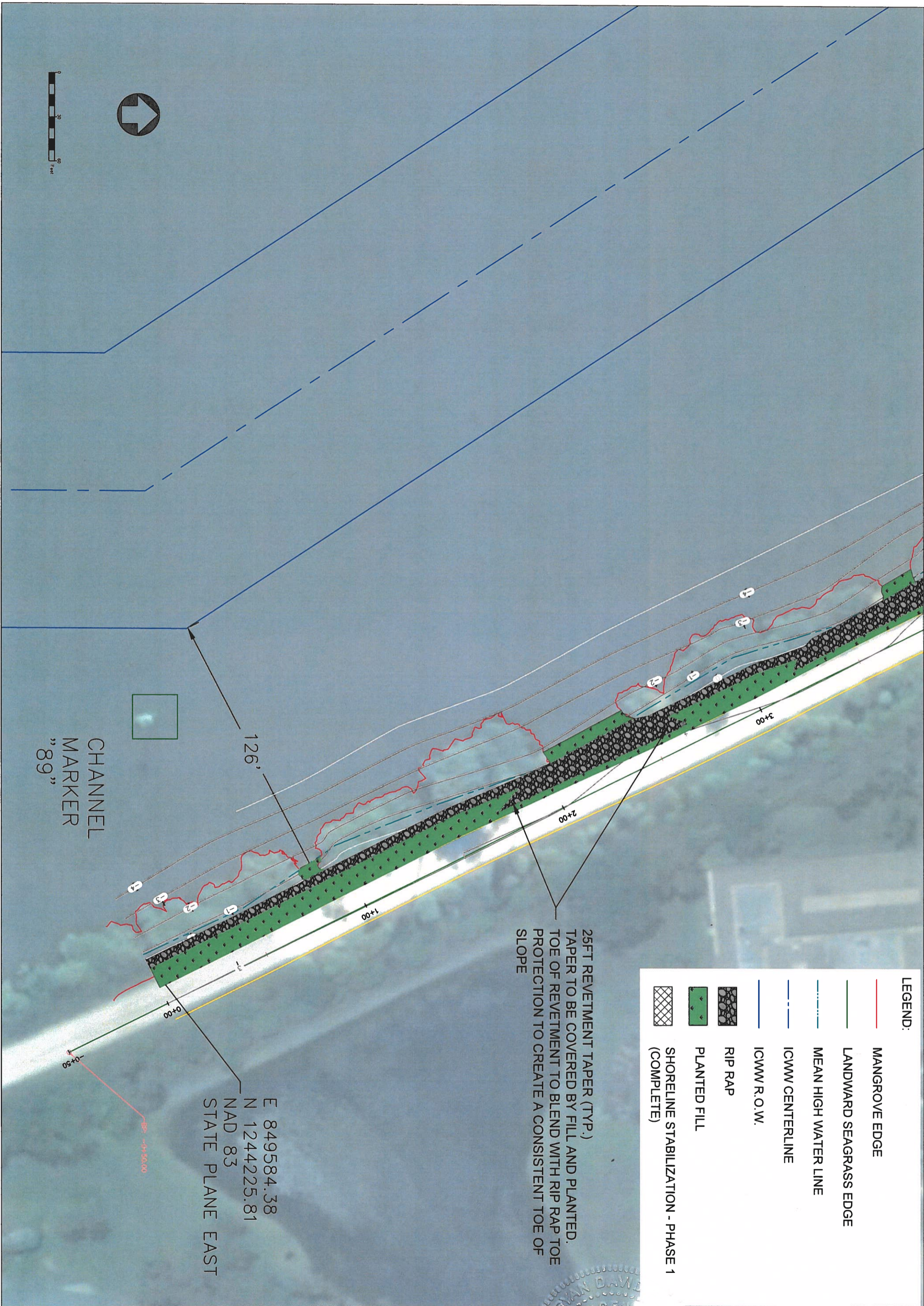


**LEGEND:**

- MANGROVE EDGE
- LANDWARD SEAGRASS EDGE
- MEAN HIGH WATER LINE
- ICWW CENTERLINE
- ICWW R.O.W.
- SHORELINE STABILIZATION - PHASE 1 (COMPLETE)



- LEGEND:
- MANGROVE EDGE
  - LANDWARD SEAGRASS EDGE
  - MEAN HIGH WATER LINE
  - ICWM CENTERLINE
  - ICWM R.O.W.
  - RIP RAP
  - PLANTED FILL
  - SHORELINE STABILIZATION - PHASE 1 (COMPLETE)



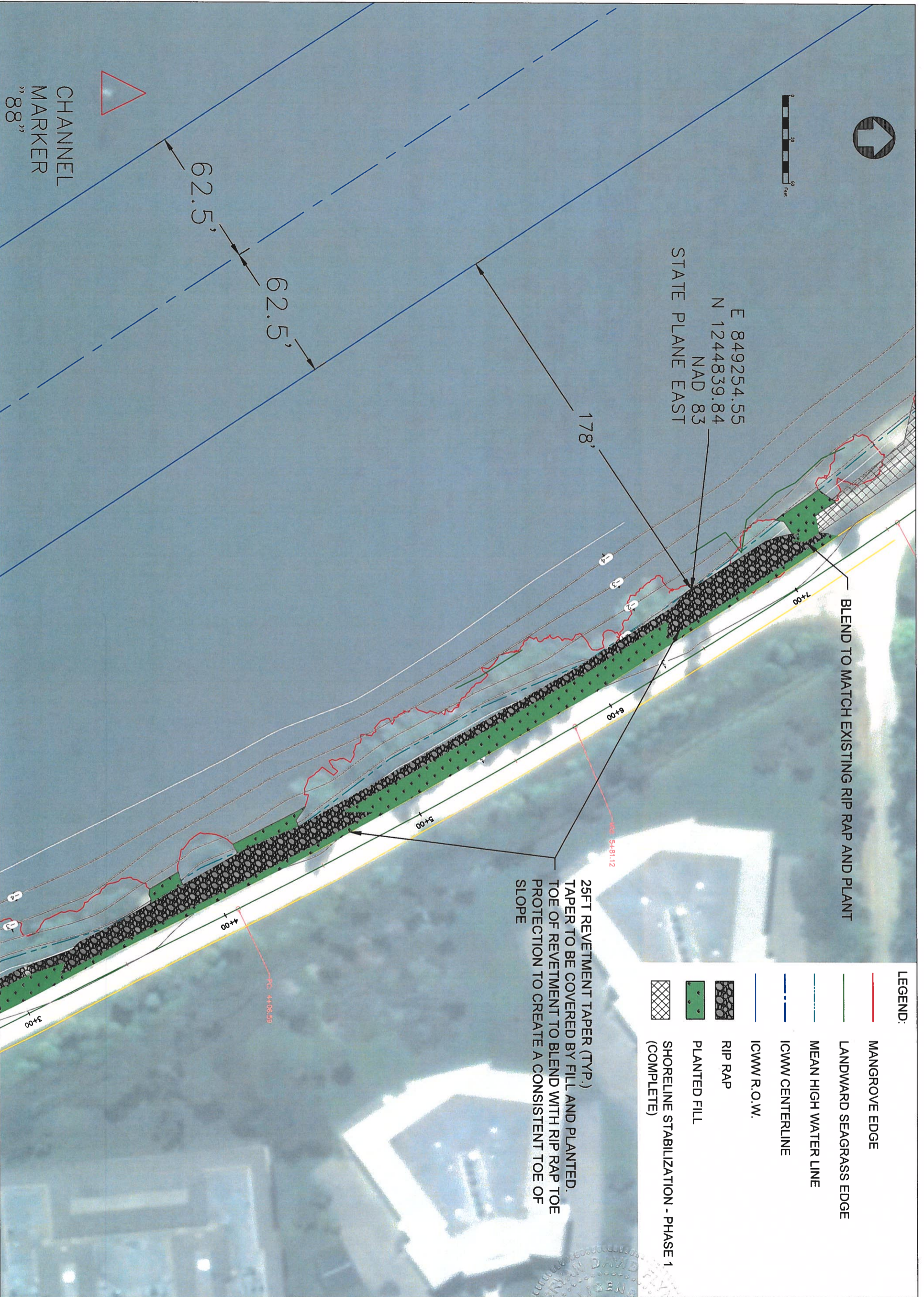
**LEGEND:**

- MANGROVE EDGE
- LANDWARD SEAGRASS EDGE
- MEAN HIGH WATER LINE
- ICWM CENTERLINE
- ICWM R.O.W.
- RIP RAP
- PLANTED FILL
- SHORELINE STABILIZATION - PHASE 1 (COMPLETE)

25FT REVEMENT TAPER (TYP.)  
TAPER TO BE COVERED BY FILL AND PLANTED.  
TOE OF REVEMENT TO BLEND WITH RIP RAP TOE  
PROTECTION TO CREATE A CONSISTENT TOE OF  
SLOPE

CHANNEL  
MARKER  
"89"

E 849584.38  
N 1244225.81  
NAD 83  
STATE PLANE EAST



LEGEND:

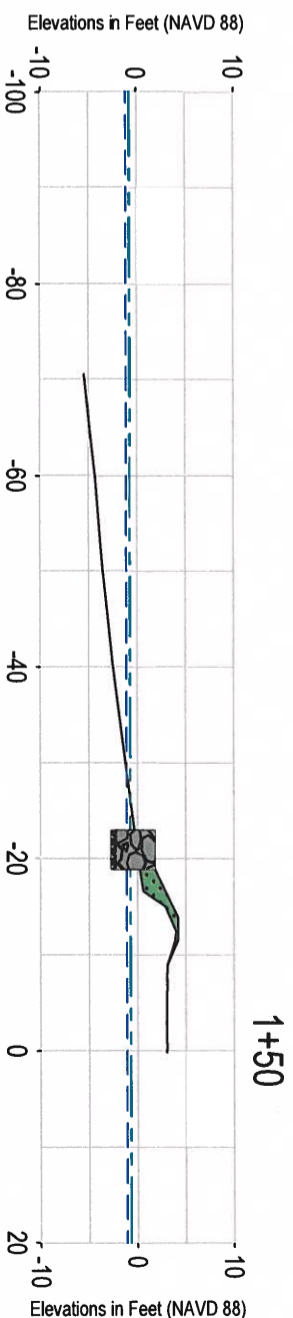
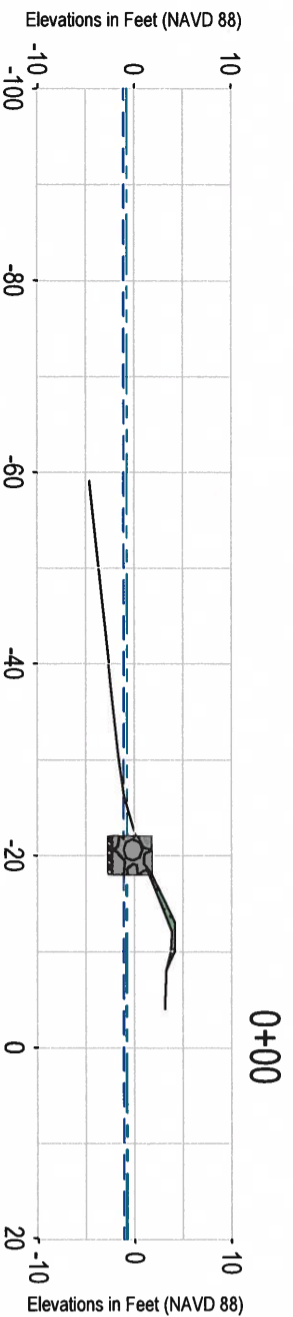
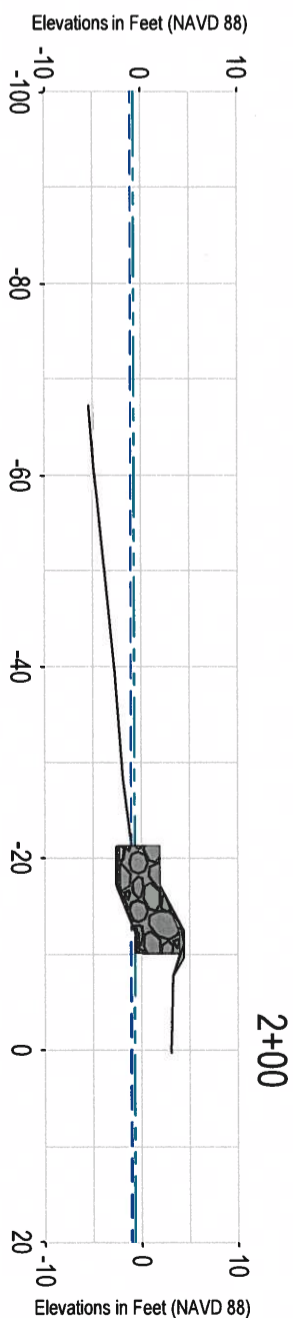
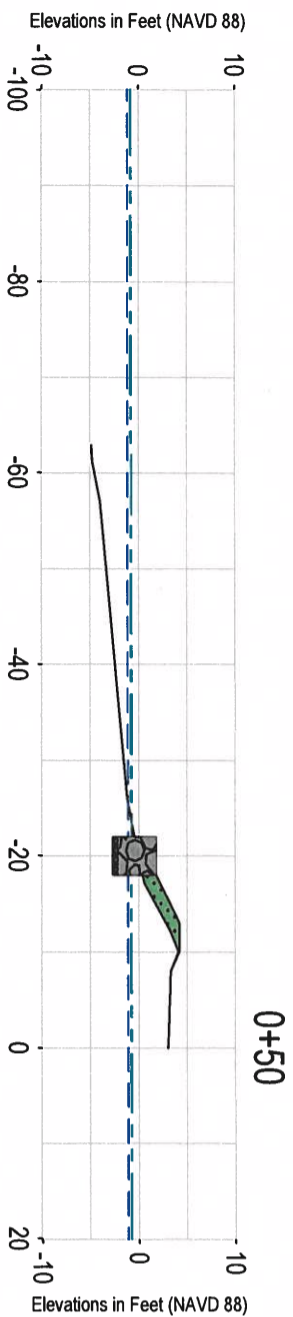
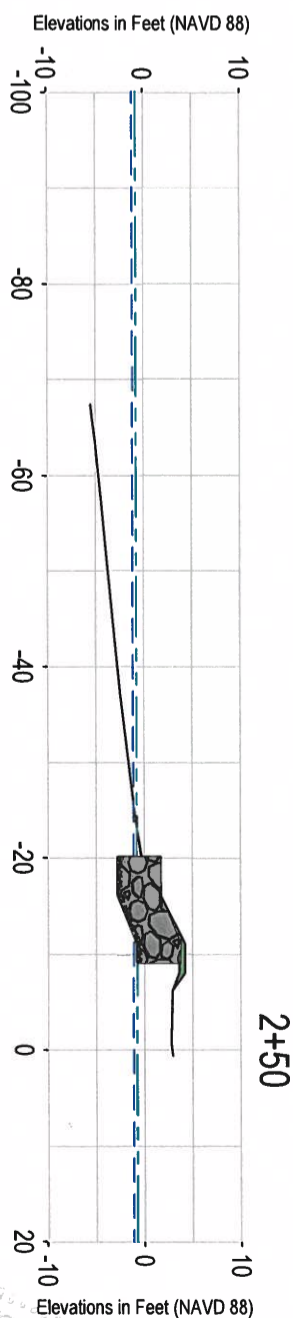
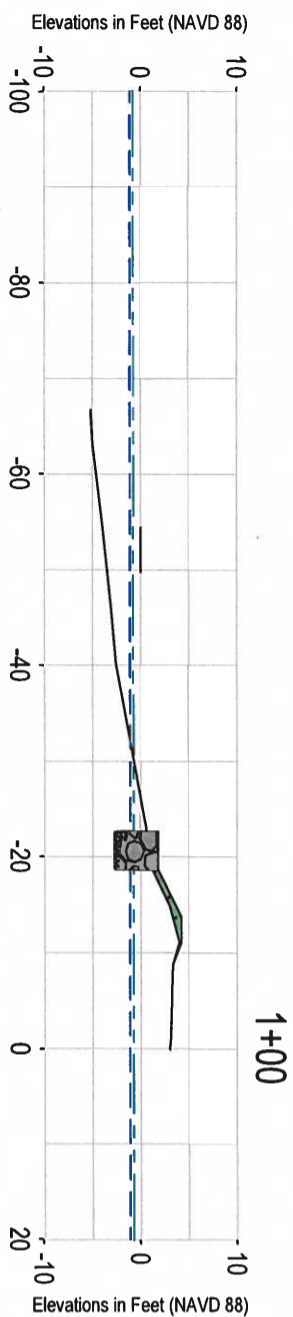
- MANGROVE EDGE
- LANDWARD SEAGRASS EDGE
- MEAN HIGH WATER LINE
- ICWW CENTERLINE
- ICWW R.O.W.
- RIP RAP
- PLANTED FILL
- SHORELINE STABILIZATION - PHASE 1 (COMPLETE)

<b>JUNGLE TRAIL</b> SHORELINE STABILIZATION PROJECT WABASSO, FL <b>PROPOSED CONDITIONS - PLAN VIEW</b>	<b>INDIAN RIVER COUNTY</b> 1801 27TH STREET VERO BEACH, FL 32960	 Ryan D. Smith 5/29/19	REVISIONS		
			BY	DATE	NO.
			DESIGNED: BDF	5/29/19	
			DRAWN: BDF	5/29/19	
		CHECKED: TJR	5/29/19		
		APPROVED: RTB	5/29/19		

**ESA**  
4200 WEST CYPRESS ST., STE. 450  
TAMPA, FL 33607  
OFFICE - 813.207.7200  
WWW.ESASOC.COM

LEGEND:

- MEAN HIGH WATER LINE (-0.72 FT NAVD 88)
- MEAN LOW WATER LINE (-1.09 FT NAVD 88)
- RIP RAP
- PLANTED FILL
- BEDDING STONE



VERTICAL SCALE: 1" = 20'  
HORIZONTAL SCALE: 1" = 20'

JUNGLE TRAIL SHORELINE  
STABILIZATION PROJECT  
WABASSO, FL  
**PROPOSED DESIGN - SECTION VIEW**

INDIAN RIVER COUNTY  
1801 27TH STREET  
VERO BEACH, FL 32960

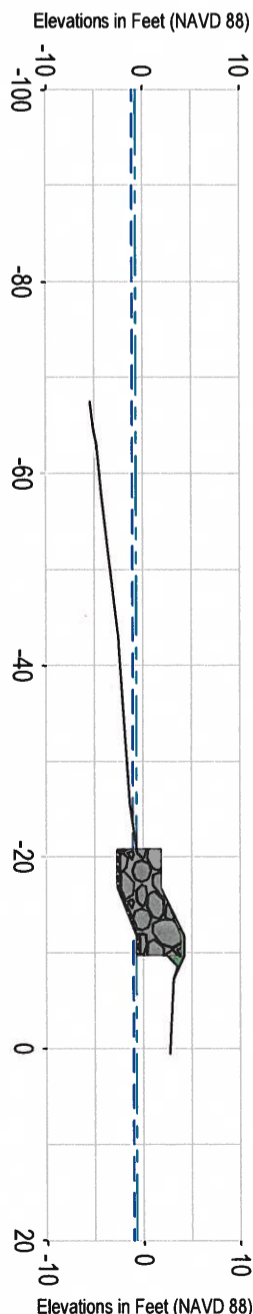
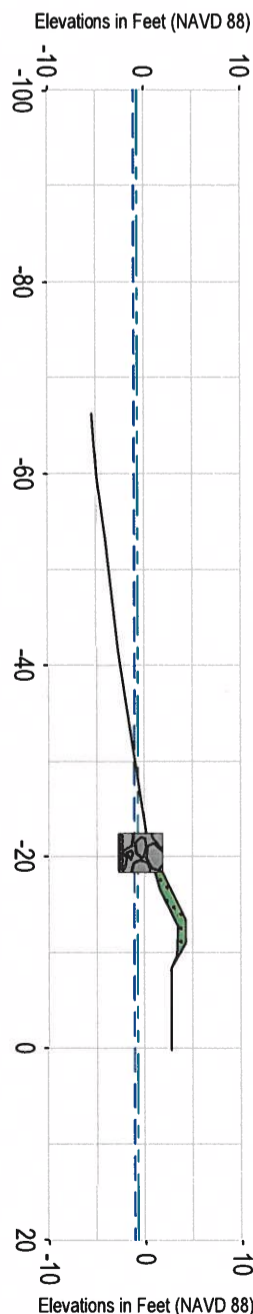
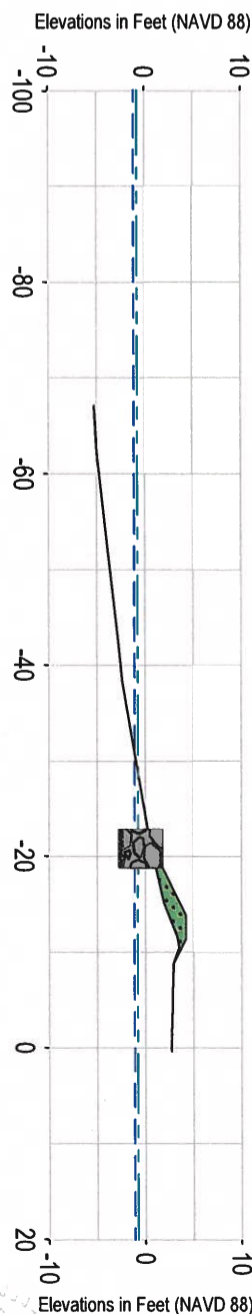
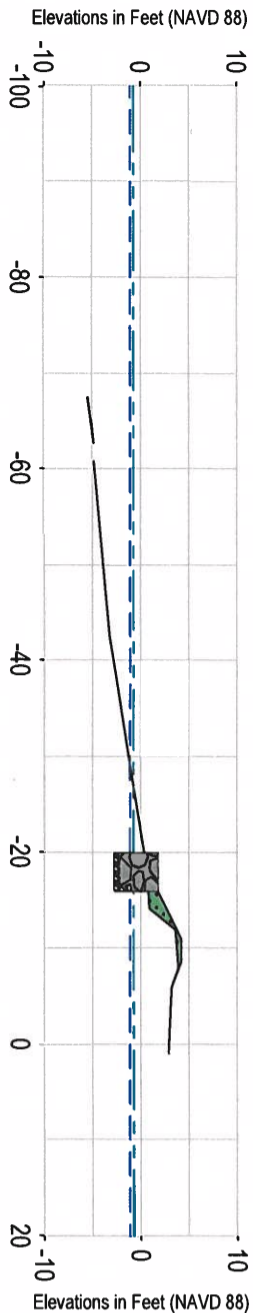
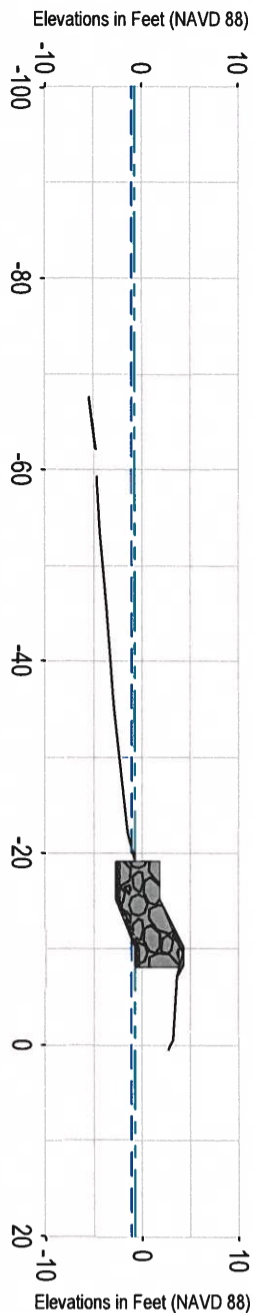
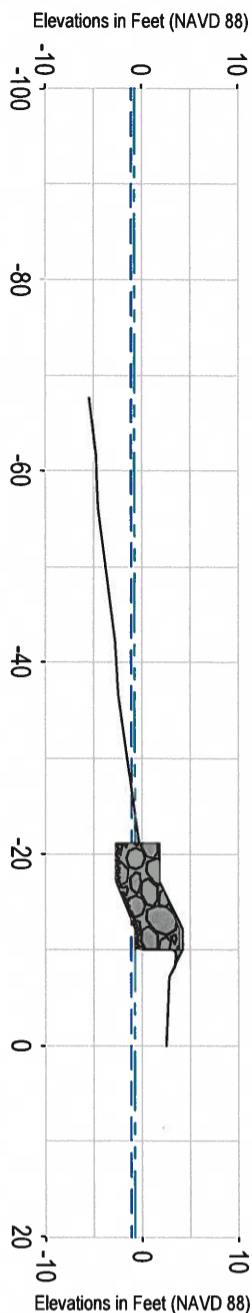
	BY	DATE	REVISIONS		
			BY	DATE	NO.
DESIGNED:	BDF	5/29/19			
DRAWN:	BDF	5/29/19			
CHECKED:	TJR	5/29/19			
APPROVED:	RTB	5/29/19			

**ESA**  
4200 WEST CYPRESS ST., STE. 450  
TAMPA, FL 33607  
OFFICE - 813.207.7200  
WWW.ESASSOC.COM

5/29/19  
10 OF 15  
**C-110**

LEGEND:

- MEAN HIGH WATER LINE (-0.72 FT NAVD 88)
- MEAN LOW WATER LINE (-1.09 FT NAVD 88)
- RIP RAP
- PLANTED FILL
- BEDDING STONE



VERTICAL SCALE: 1" = 20'  
HORIZONTAL SCALE: 1" = 20'

JUNGLE TRAIL SHORELINE  
STABILIZATION PROJECT  
WABASSO, FL  
**PROPOSED DESIGN - SECTION VIEW**

INDIAN RIVER COUNTY  
1801 27TH STREET  
VERO BEACH, FL 32960

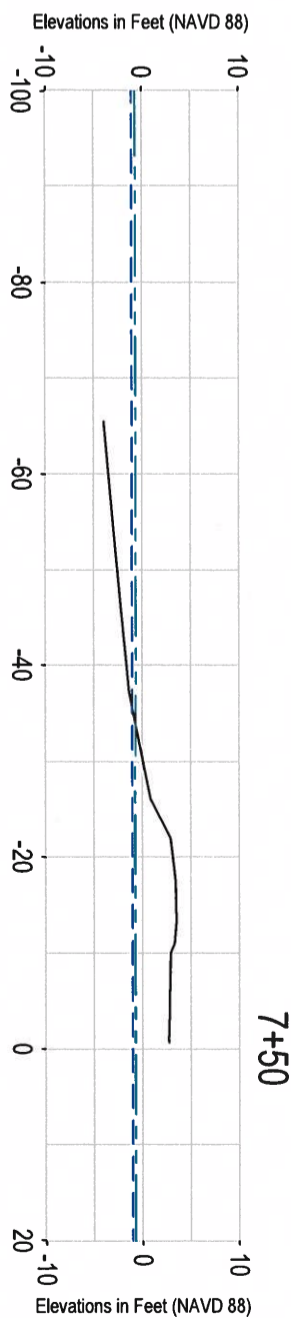
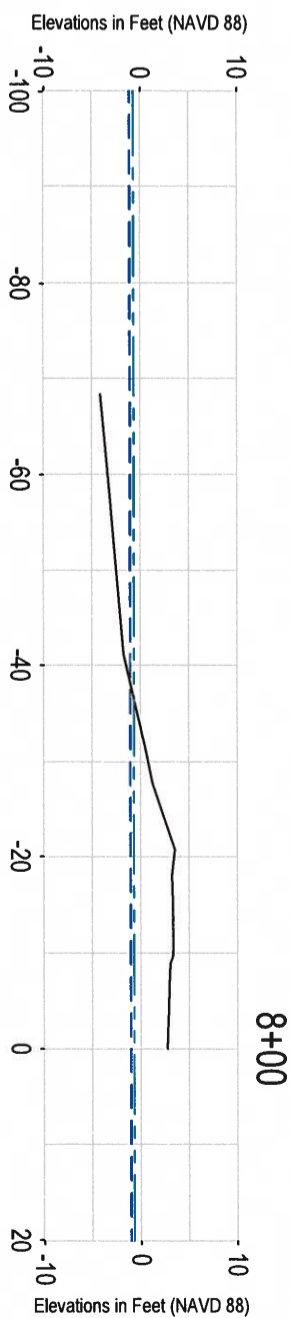
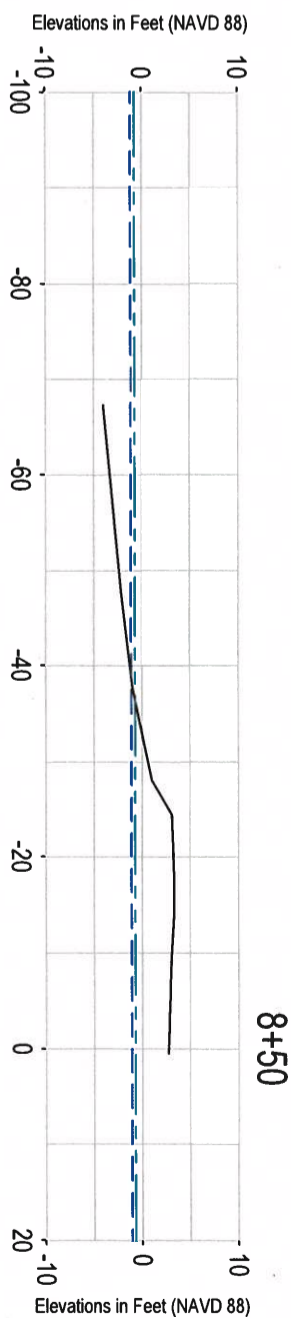
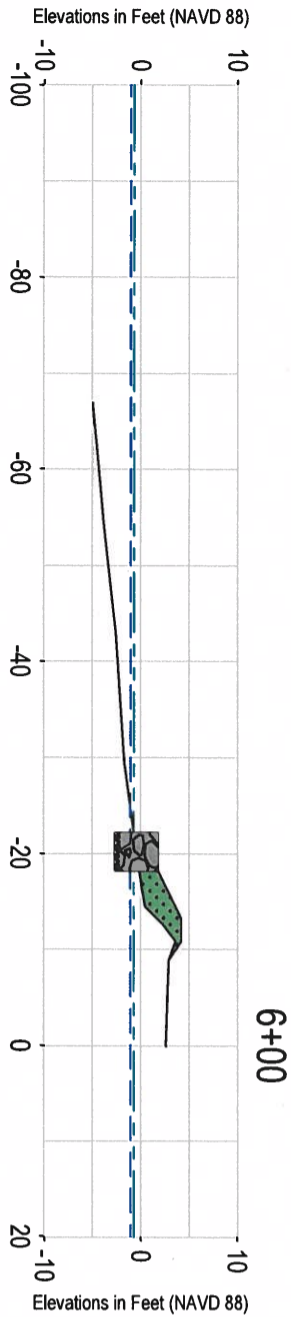
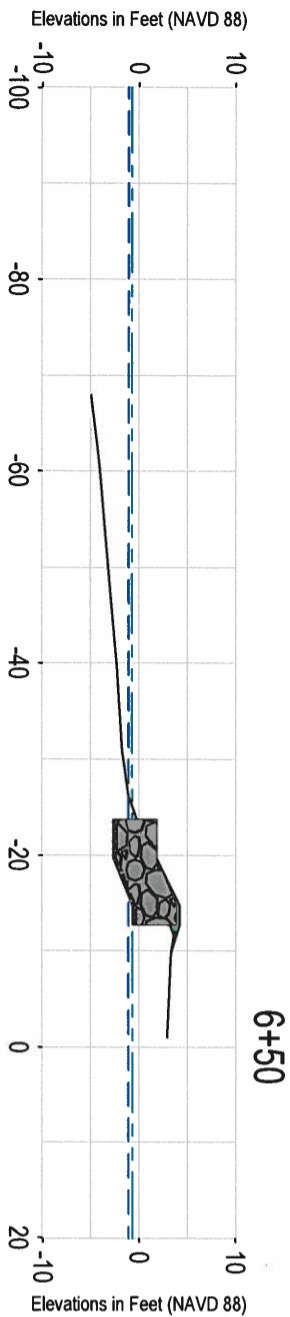
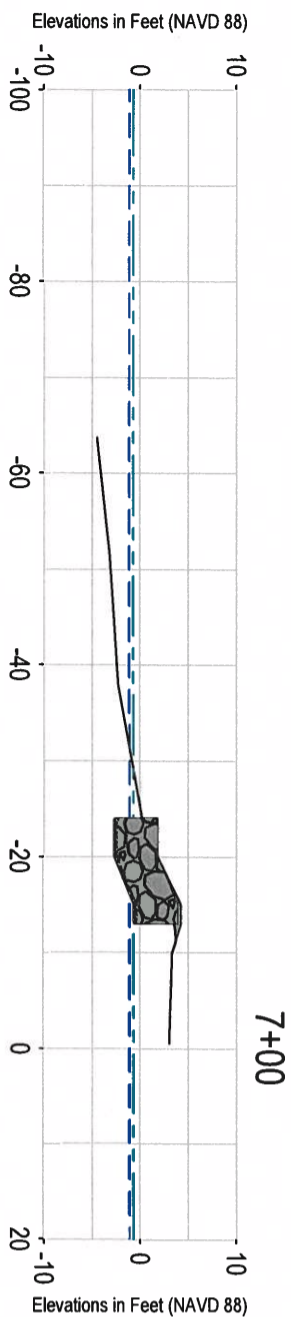
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5/29/19  
11 OF 15  
**C-111**

LEGEND:

- MEAN HIGH WATER LINE (-0.72 FT NAVD 88)
- MEAN LOW WATER LINE (-1.09 FT NAVD 88)
- RIP RAP
- PLANTED FILL
- BEDDING STONE



VERTICAL SCALE: 1" = 20'  
HORIZONTAL SCALE: 1" = 20'

JUNGLE TRAIL SHORELINE  
STABILIZATION PROJECT  
WABASSO, FL  
**PROPOSED DESIGN - SECTION VIEW**

INDIAN RIVER COUNTY  
1801 27TH STREET  
VERO BEACH, FL 32960

*By: [Signature]*  
5/29/19

	BY	DATE	REVISIONS		
			BY	DATE	NO.
DESIGNED:	BDF	5/29/19			
DRAWN:	BDF	5/29/19			
CHECKED:	TJR	5/29/19			
APPROVED:	RTB	5/29/19			

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TAMPA, FL 33607  
OFFICE - 813.267.7200  
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5/29/19  
12 OF 15  
**C-112**

LEGEND:

MEAN HIGH WATER LINE (-0.72 FT NAVD 88)

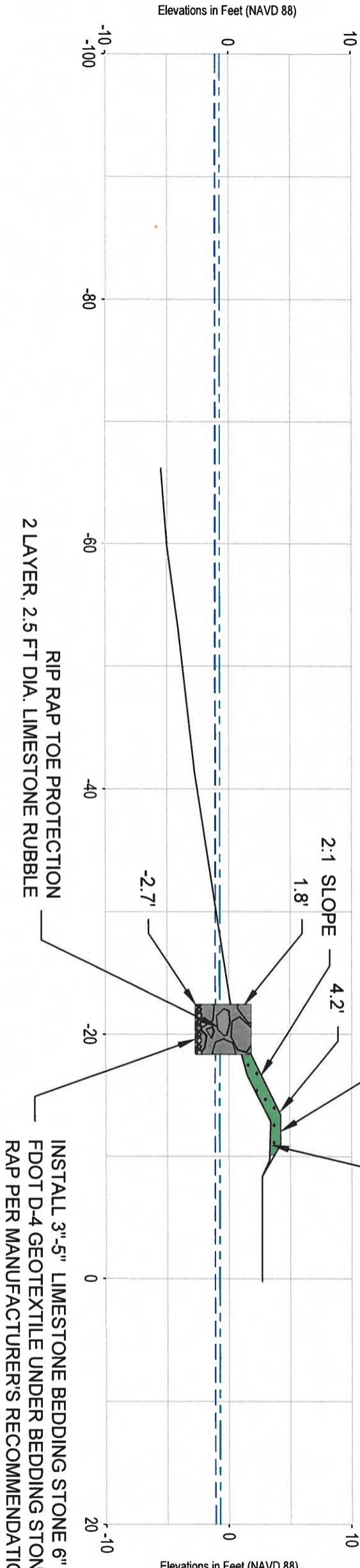
MEAN LOW WATER LINE (-1.09 FT NAVD 88)

RIP RAP

BEDDING STONE

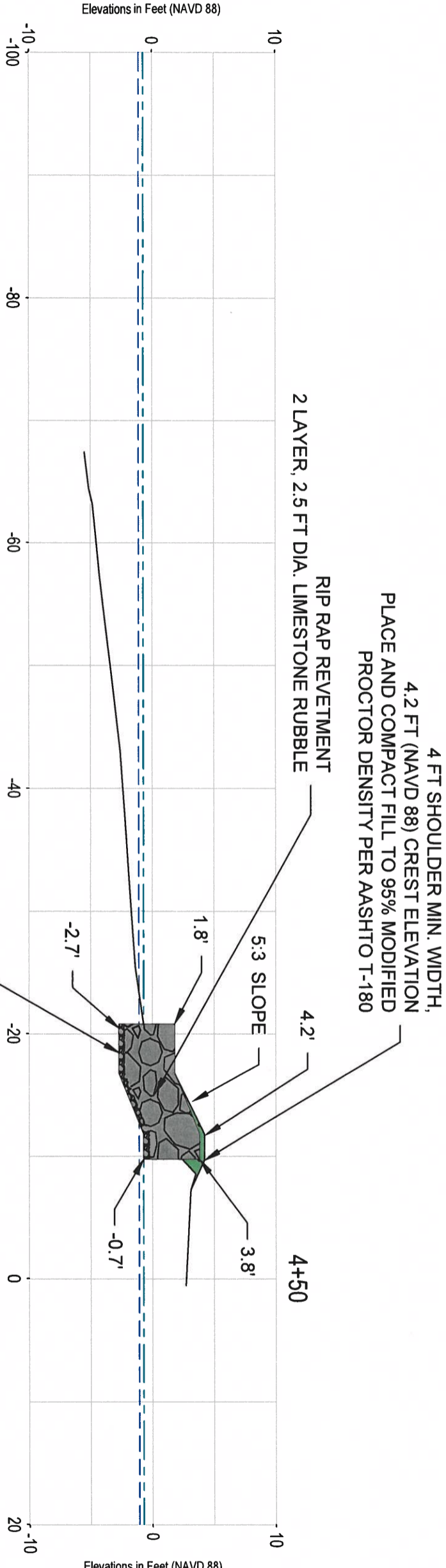
PLANTED FILL

APPLY EROSION CONTROL BLANKET (N.A. GREEN SC-150 OR EQUAL) TO SLOPE AFTER FILL IS PLACED AND COMPACTED.



VERTICAL SCALE: 1" = 10'

HORIZONTAL SCALE: 1" = 10'



JUNGLE TRAIL SHORELINE STABILIZATION PROJECT

WABASSO, FL

PROPOSED DESIGN - DETAIL VIEW

INDIAN RIVER COUNTY

1801 27TH STREET

VERO BEACH, FL 32960

ESA

4200 WEST CYPRESS ST., STE. 450

TAMPA, FL 33607

OFFICE - 813.207.7200

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DESIGNED:			REVISIONS		
BY	DATE		BY	DATE	NO.
DESIGNED:	BDF	5/29/19			
DRAWN:	BDF	5/29/19			
CHECKED:	TJR	5/29/19			
APPROVED:	RTB	5/29/19			

5/29/19

13 OF 15

C-113

LEGEND:

MANGROVE EDGE

LANDWARD SEAGRASS EDGE

MEAN HIGH WATER LINE

ICMW CENTERLINE

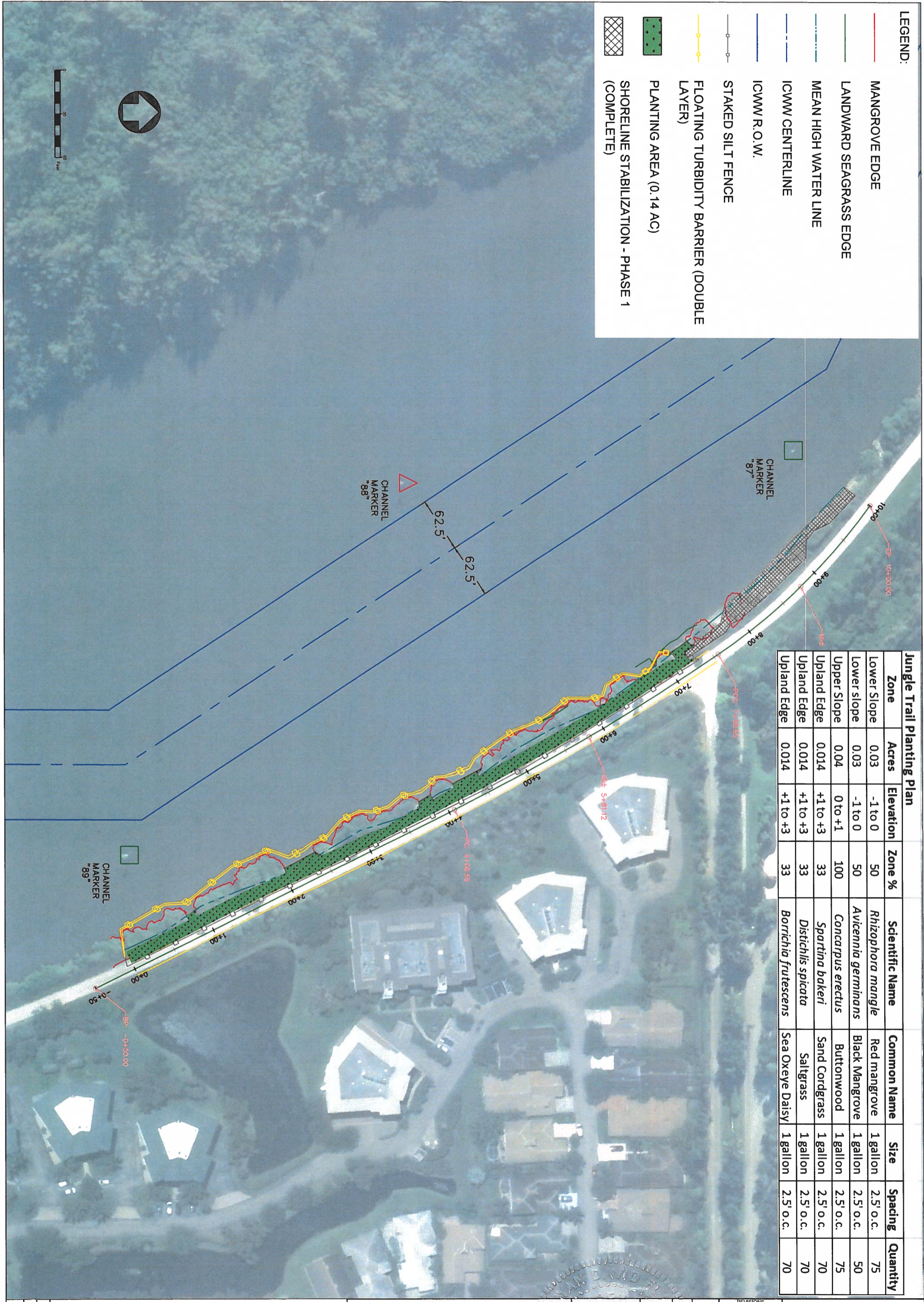
ICMW R.O.W.

STAKED SILT FENCE

FLOATING TURBIDITY BARRIER (DOUBLE LAYER)

PLANTING AREA (0.14 AC)

SHORELINE STABILIZATION - PHASE 1 (COMPLETE)



Jungle Trail Planting Plan						
Zone	Acres	Elevation	Zone %	Scientific Name	Common Name	Size
Lower Slope	0.03	-1 to 0	50	Rhizophora mangle	Red mangrove	1 gallon
Lower Slope	0.03	-1 to 0	50	Avicennia germinans	Black Mangrove	1 gallon
Upper Slope	0.04	0 to +1	100	Concarpus erectus	Buttonwood	1 gallon
Upland Edge	0.014	+1 to +3	33	Spartina bakeri	Sand Cordgrass	1 gallon
Upland Edge	0.014	+1 to +3	33	Distichlis spicata	Saltgrass	1 gallon
Upland Edge	0.014	+1 to +3	33	Borrichia frutescens	Sea Oxeye Daisy	1 gallon

JUNGLE TRAIL  
SHORELINE STABILIZATION PROJECT  
WABASSO, FL  
PLAN VIEW - PROPOSED MANGROVE PLANTINGS & BEST MANAGEMENT PRACTICES

INDIAN RIVER COUNTY  
1801 27TH STREET  
VERO BEACH, FL 32960

DESIGNED: BDF 5/29/19

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5/29/19

14 OF 15

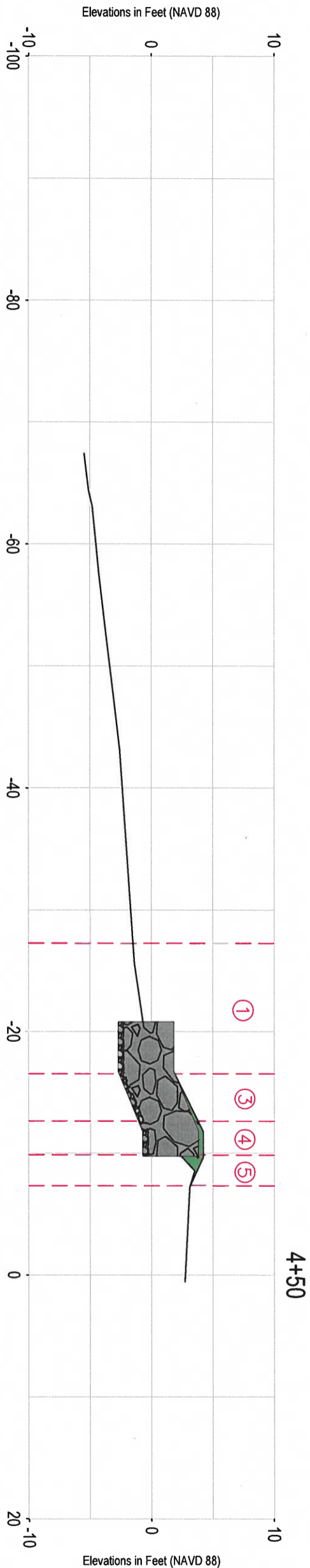
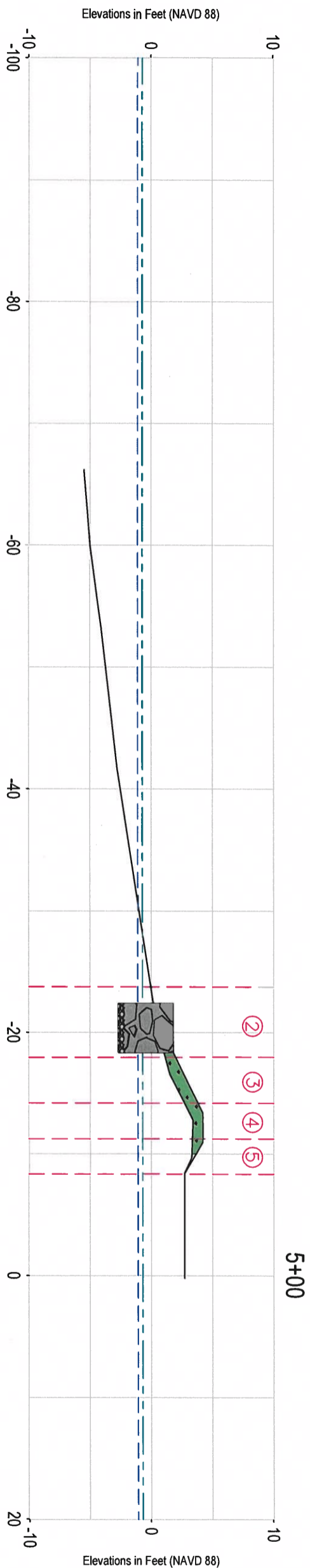
C-114

ES&A

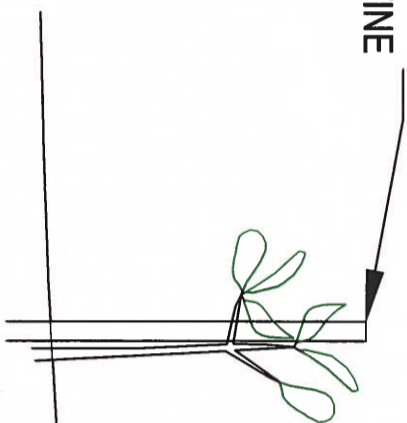
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LEGEND:

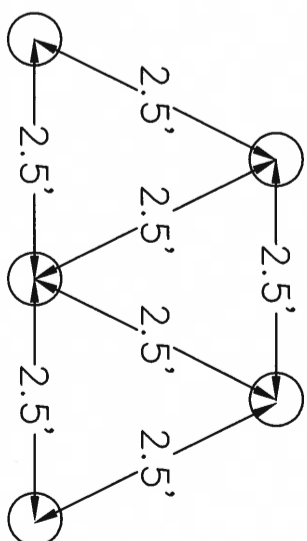
- MEAN HIGH WATER LINE (-0.72 FT NAVD 88)
- MEAN LOW WATER LINE (-1.09 FT NAVD 88)
- RIP RAP
- PLANTED FILL
- BEDDING STONE
- BUTTONWOOD ZONE
- RED MANGROVE ZONE
- BLACK MANGROVE ZONE
- SAND CORDGRASS/SALT GRASS ZONE
- SEA OXEYE DAISY ZONE



MANGROVE PLANTINGS TO BE STAKED  
AND SECURED WITH TWINE



PLANT SPACING



VERTICAL SCALE: 1" = 10'  
HORIZONTAL SCALE: 1" = 10'

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