

Tigertail Lagoon/Sand Dollar Island Restoration, Marco Island Project Description

The Tigertail Lagoon/Sand Dollar Island Restoration on Marco Island is designed to maintain and enhance an existing coastal barrier system consisting of a 2 mile-long sand spit and tidal lagoon ecosystem along the northwest shoreline of Marco Island. The Tigertail Lagoon and Sand Dollar Island ecosystem is a protected natural preserve and a critical wildlife area that provides valuable habitat for a variety of birds, sea turtles, manatees, and seagrasses. Tigertail Lagoon and Sand Dollar Island are also valuable Marco Island recreational resources for residents and tourists for birding, fishing, kayaking, paddle boarding, kitesurfing, and, on the northern half, boating. The ecosystem is accessed by the public via Collier County's Tigertail Beach Park at the southern end of the lagoon and via boat at the northern end of the lagoon. Tigertail Beach is one of 510 points on the Great Florida Birding and Wildlife Trail and is considered one of the best all-around birding spots in southwest Florida. The County Park is one of only three public beach access points on Marco Island and receives over 200,000 visitors annually. It has a large public parking area, playground, food concession, and watercraft rentals. A shuttle bus runs from some hotels to the park. An increasing number of private, rental, and commercial tourist boats access the lagoon from its northern entrance. The Tigertail Lagoon and Sand Dollar Island system was impacted by Hurricane Irma in 2017 and was evolving toward closure when it was further impacted by Hurricane Ian in late September this year.

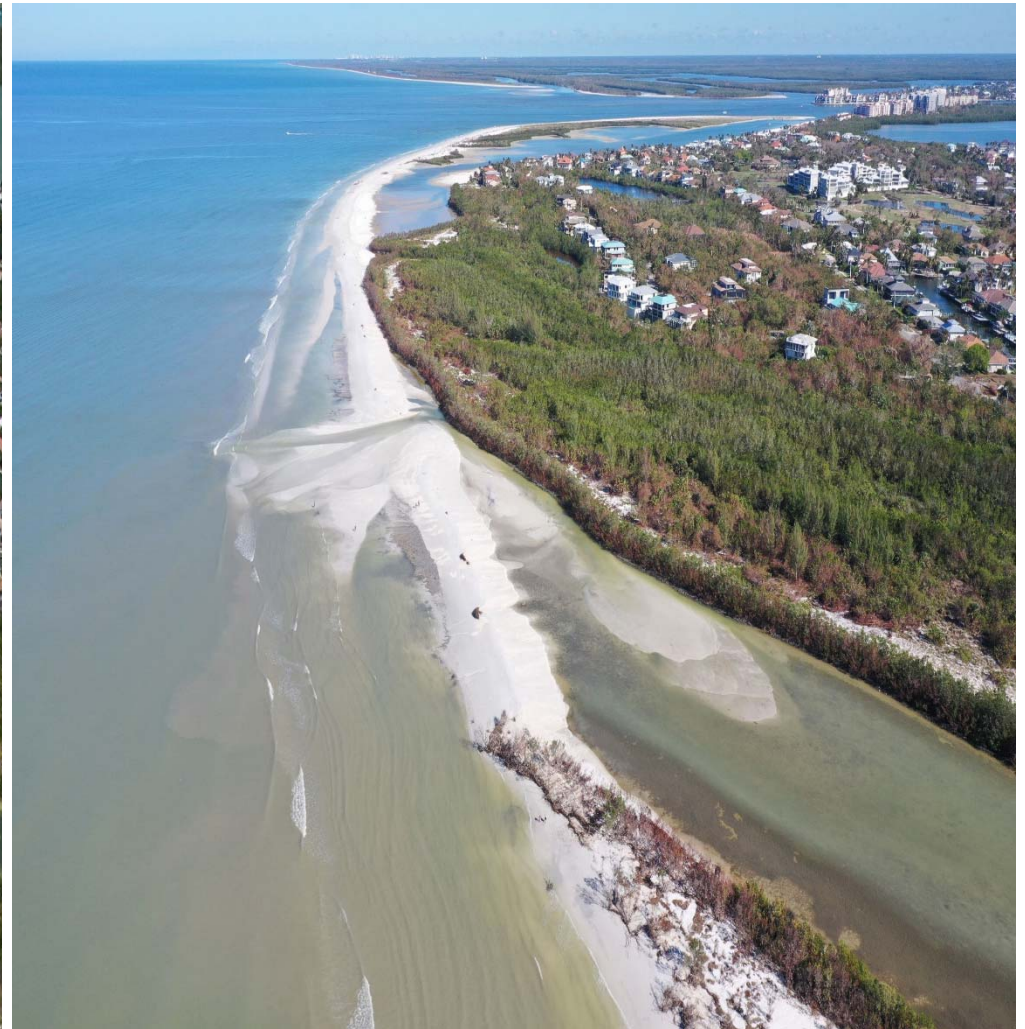
The project is part of a nature based adaptive management plan to restore and stabilize the sandspit and tidal lagoon through cyclic use of sediment within the system. It is funded by the City of Marco Island through the Hideaway Beach Tax District. The project aims to restore and enhance the barrier sandspit degraded by a sequence of storms since Hurricane Irma and re-establish the continuous lagoon flow channel thereby enhancing tidal exchange and water quality. Total wetland area will be increased by relocating the sand spit seaward of its present location to where it was located in approximately 2017. The reconstructed beach berm will provide enhanced resiliency to high frequency weather events protecting the lagoon and critical wildlife area. Sediment is mainly sourced from the existing sand spit and an innovative sand trap that will maintain the northern lagoon entrance open to the gulf, while providing beneficial re-use for excess sediment that continues to accumulate at the end of the spit. Collier County's Tigertail Beach Park is within the project area and will benefit from the lagoon's significantly improved tidal flow and the stabilization of wetland and beach areas that are susceptible to over wash and onshore collapse. The Tigertail Lagoon portion within the County Park constitutes approximately 25% of the total lagoon area.

The project was permitted by the Florida Department of Environmental Protection and the US Army Corps of Engineers in February and July of 2022, respectively. The City awarded the project to Ahtna Marine & Construction Company in September, 2022 for a total of \$3.3 million.

Exhibit 1. Tigertail Lagoon and Sand Dollar Island comparisons 2017-2022

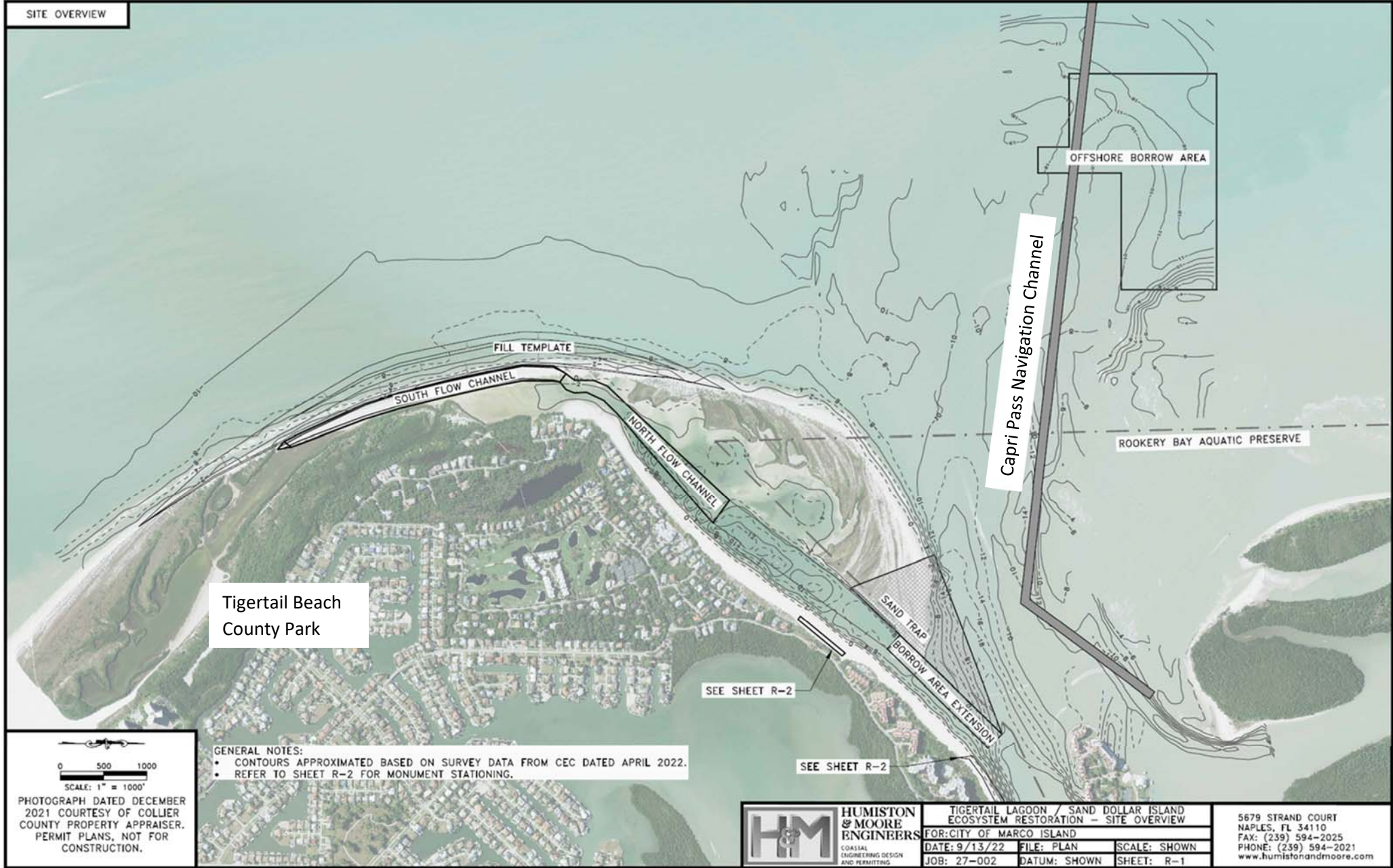


2017 conditions



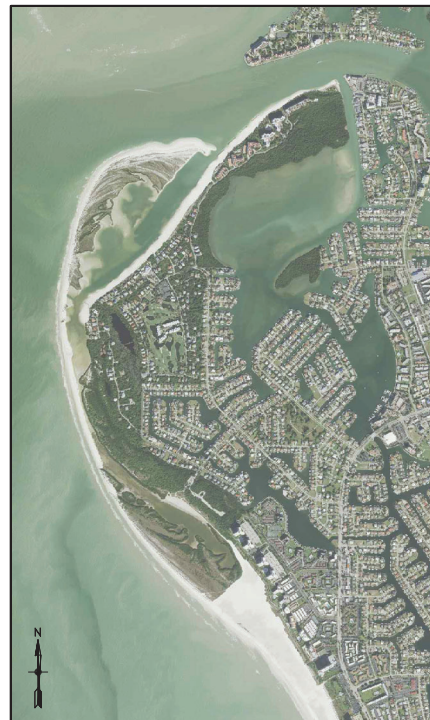
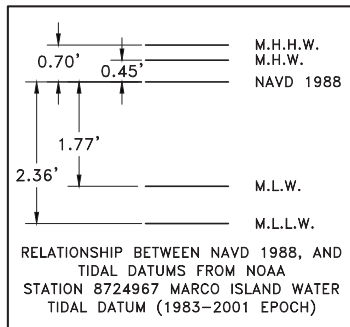
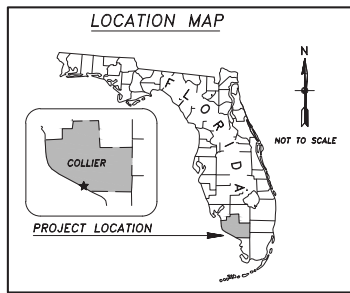
2022 conditions

Exhibit 2. Site plan and project features



TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION MARCO ISLAND, FLORIDA PERMIT PLANS

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SHEET INDEX

COVER	COVER SHEET
SP-1	OVERALL SITE PLAN
SP-2	ECOSYSTEM RESTORATION SITE PLAN
SP-3	SUBMERGED ENVIRONMENTAL RESOURCES PLAN
SP-4	EMERGENT ENVIRONMENTAL RESOURCES PLAN
XS-1	CROSS SECTIONS
XS-2	LAGOON & SAND TRAP CROSS SECTIONS
XS-3	LAGOON & FLOW CHANNEL CROSS SECTIONS
XS-4	LAGOON, FLOW CHANNEL, BEACH BERM CROSS SECTIONS
XS-5	FLOW CHANNEL & BEACH BERM CROSS SECTIONS
XS-6	LAGOON & BEACH BERM CROSS SECTIONS

NOTES:

1. AERIAL PHOTOGRAPH DECEMBER 2020 PROVIDED COURTESY OF COLLIER COUNTY PROPERTY APPRAISER.
2. COORDINATES SHOWN ARE IN FEET BASED ON THE NORTH AMERICAN DATUM OF 1983, EAST ZONE (NAD83).
3. ELEVATIONS SHOWN ARE IN FEET BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. THESE PERMIT DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION.

Mohamed A.
Dabees PE 58003

Digitally signed by Mohamed A. Dabees PE 58003
Date: 2021.08.20 14:27:03 -04'00'



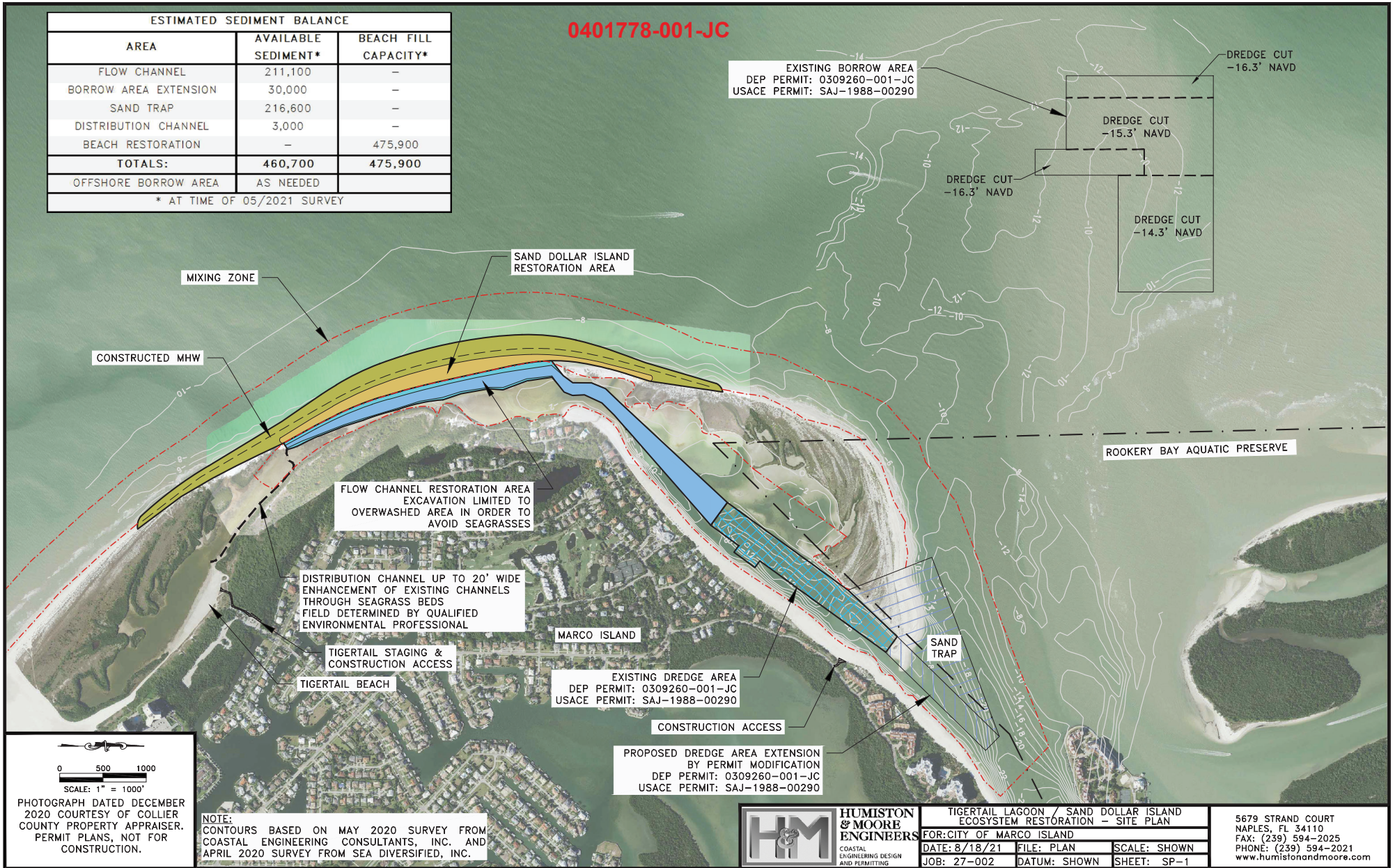
TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - COVER		
FOR: CITY OF MARCO ISLAND		
DATE: 8/18/21	FILE: PLAN	SCALE: N/A
JOB: 27-002	DATUM: SHOWN	SHEET: COVER

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ESTIMATED SEDIMENT BALANCE		
AREA	AVAILABLE SEDIMENT*	BEACH FILL CAPACITY*
FLOW CHANNEL	211,100	-
BORROW AREA EXTENSION	30,000	-
SAND TRAP	216,600	-
DISTRIBUTION CHANNEL	3,000	-
BEACH RESTORATION	-	475,900
TOTALS:	460,700	475,900
OFFSHORE BORROW AREA	AS NEEDED	

* AT TIME OF 05/2021 SURVEY



PHOTOGRAPH DATED DECEMBER 2020 COURTESY OF COLLIER COUNTY PROPERTY APPRAISER. PERMIT PLANS, NOT FOR CONSTRUCTION.

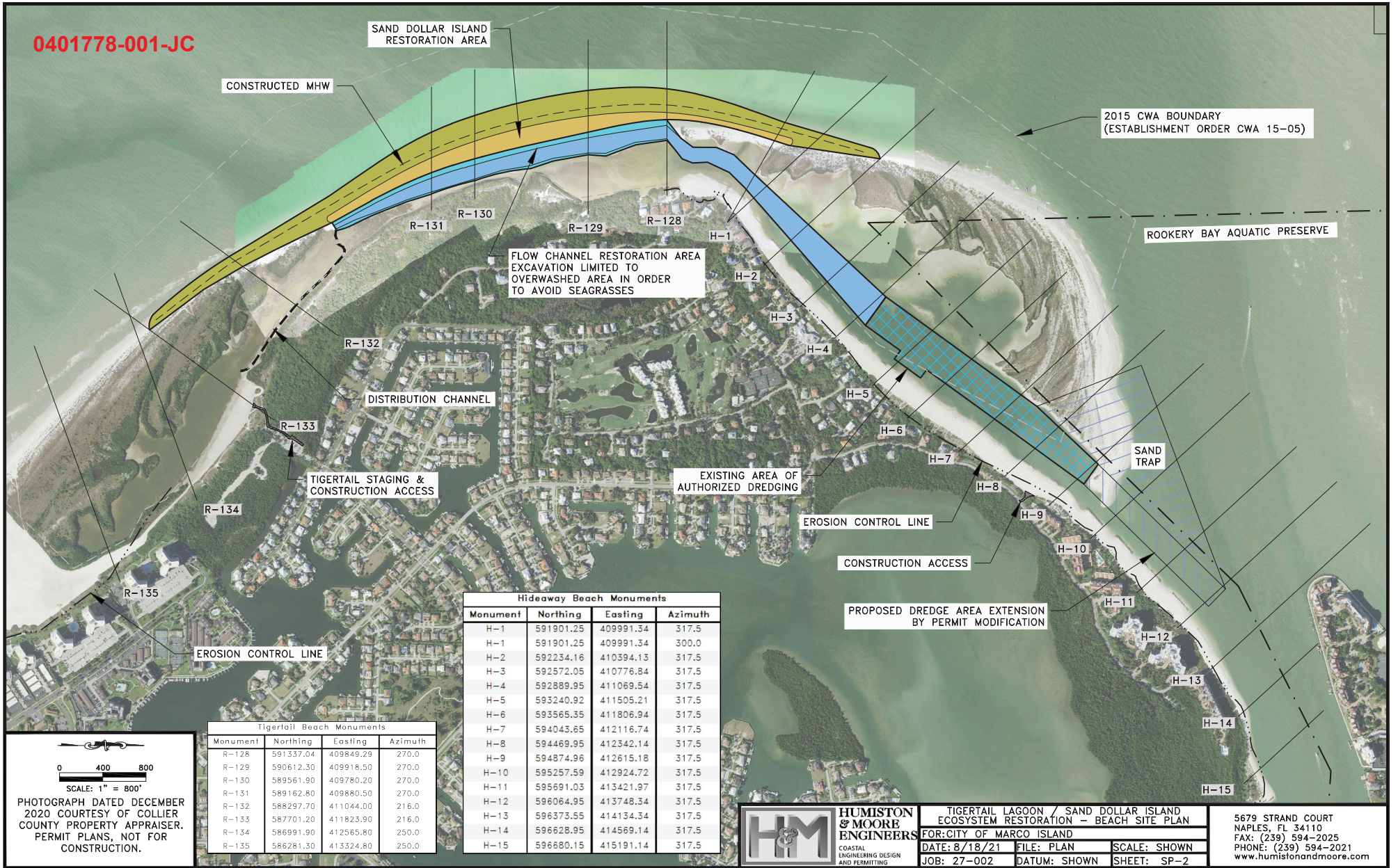
NOTE: CONTOURS BASED ON MAY 2020 SURVEY FROM COASTAL ENGINEERING CONSULTANTS, INC. AND APRIL 2020 SURVEY FROM SEA DIVERSIFIED, INC.

HM
HUMISTON & MOORE ENGINEERS
COASTAL ENGINEERING DESIGN AND PERMITTING

TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - SITE PLAN
 FOR: CITY OF MARCO ISLAND
 DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
 JOB: 27-002 DATUM: SHOWN SHEET: SP-1

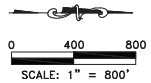
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Hideaway Beach Monuments			
Monument	Northing	Easting	Azimuth
H-1	591901.25	409991.34	317.5
H-1	591901.25	409991.34	300.0
H-2	592234.16	410394.13	317.5
H-3	592572.05	410776.84	317.5
H-4	592889.95	411069.54	317.5
H-5	593240.92	411505.21	317.5
H-6	593565.35	411806.94	317.5
H-7	594043.65	412116.74	317.5
H-8	594469.95	412342.14	317.5
H-9	594874.96	412615.18	317.5
H-10	595257.59	412924.72	317.5
H-11	595691.03	413421.97	317.5
H-12	596064.95	413748.34	317.5
H-13	596373.55	414134.34	317.5
H-14	596628.95	414569.14	317.5
H-15	596880.15	415191.14	317.5

Tigertail Beach Monuments			
Monument	Northing	Easting	Azimuth
R-128	591337.04	409849.29	270.0
R-129	590612.30	409918.50	270.0
R-130	589561.90	409780.20	270.0
R-131	589162.80	409880.50	270.0
R-132	588297.70	411044.00	216.0
R-133	587701.20	411823.90	216.0
R-134	586991.90	412565.80	250.0
R-135	586281.30	413324.80	250.0



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TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - BEACH SITE PLAN
 FOR: CITY OF MARCO ISLAND
 DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
 JOB: 27-002 DATUM: SHOWN SHEET: SP-2

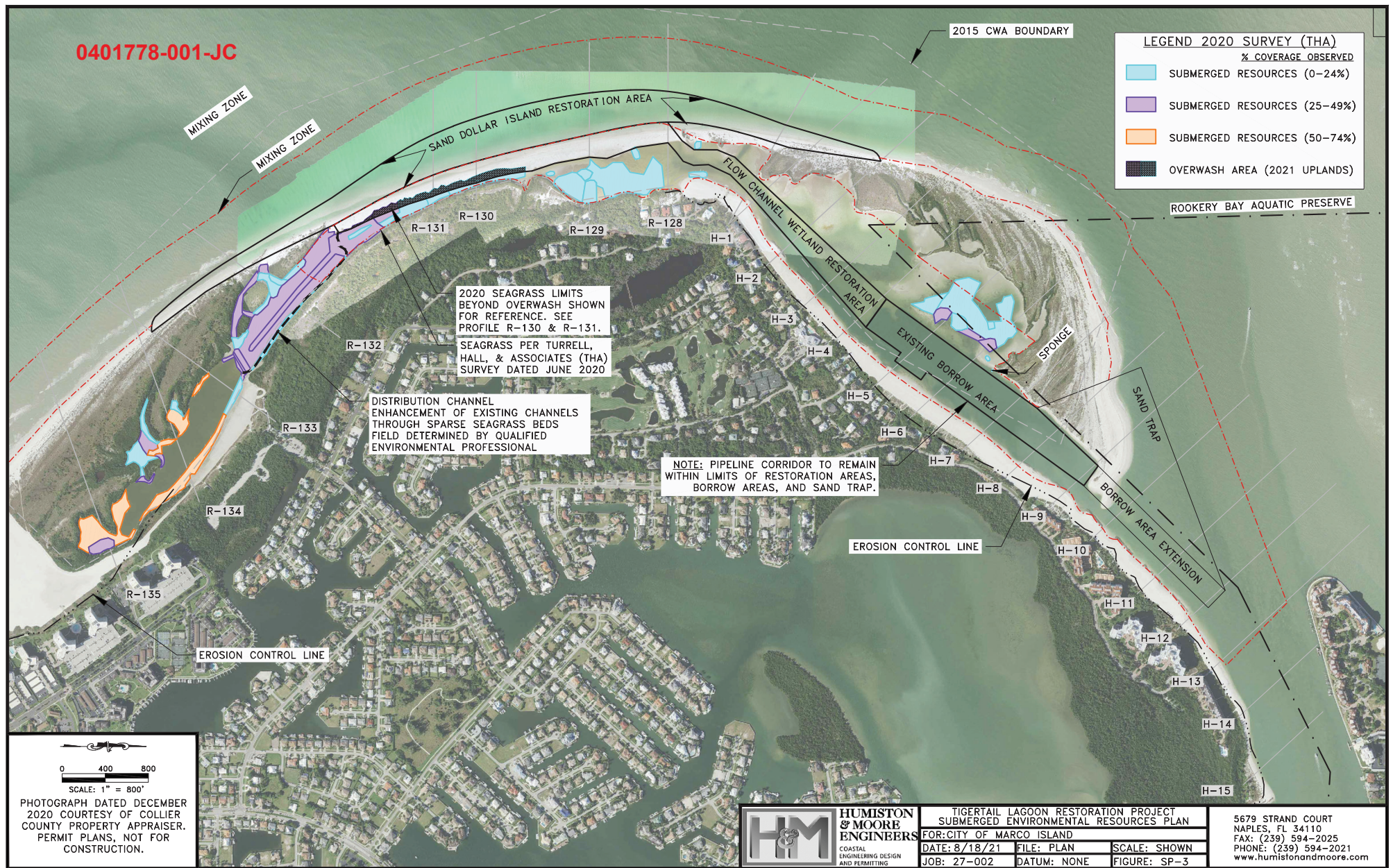
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LEGEND 2020 SURVEY (THA)

% COVERAGE OBSERVED

- SUBMERGED RESOURCES (0-24%)
- SUBMERGED RESOURCES (25-49%)
- SUBMERGED RESOURCES (50-74%)
- OVERWASH AREA (2021 UPLANDS)

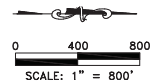


2020 SEAGRASS LIMITS BEYOND OVERWASH SHOWN FOR REFERENCE. SEE PROFILE R-130 & R-131.

SEAGRASS PER TURRELL, HALL, & ASSOCIATES (THA) SURVEY DATED JUNE 2020

DISTRIBUTION CHANNEL ENHANCEMENT OF EXISTING CHANNELS THROUGH SPARSE SEAGRASS BEDS FIELD DETERMINED BY QUALIFIED ENVIRONMENTAL PROFESSIONAL

NOTE: PIPELINE CORRIDOR TO REMAIN WITHIN LIMITS OF RESTORATION AREAS, BORROW AREAS, AND SAND TRAP.



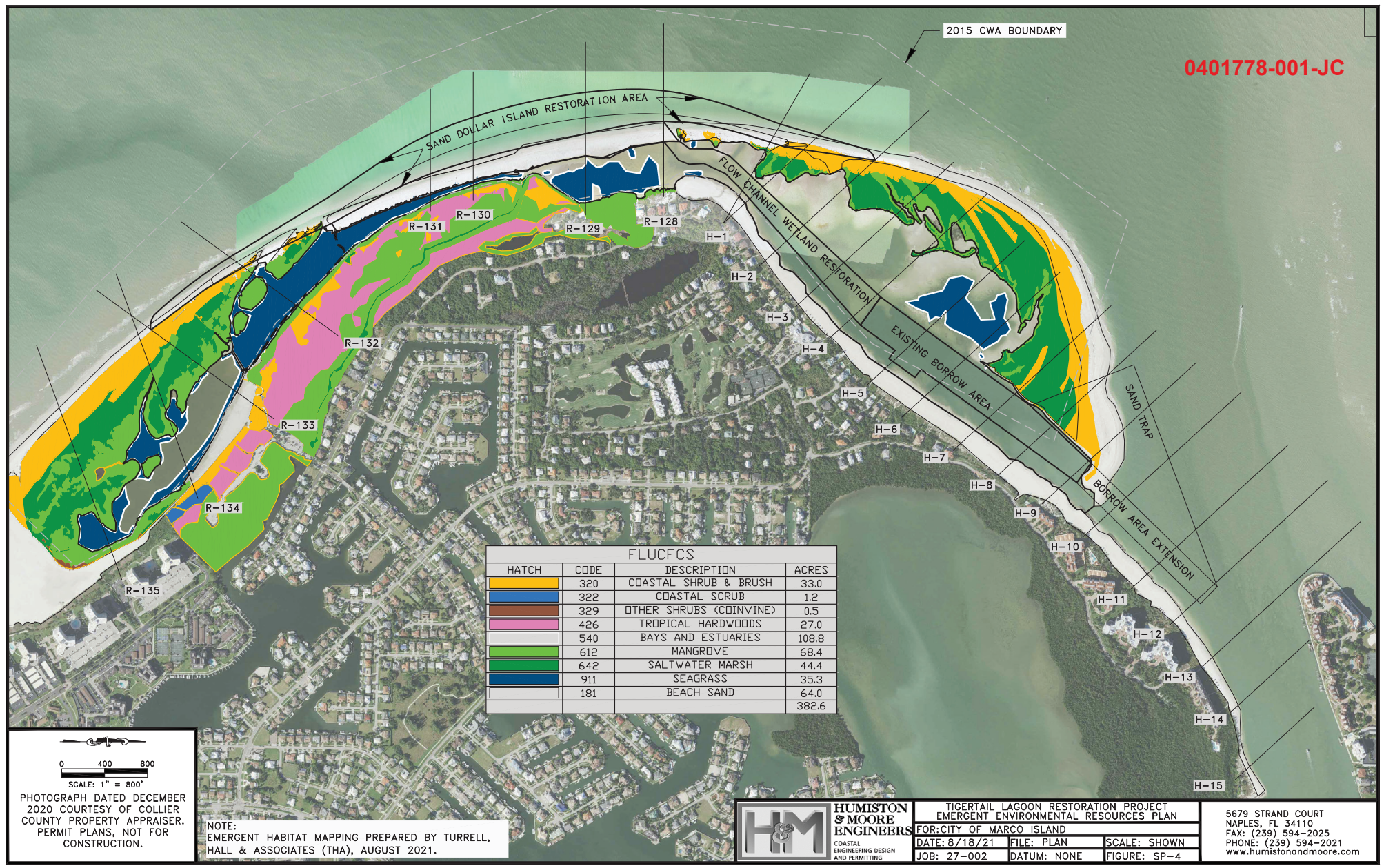
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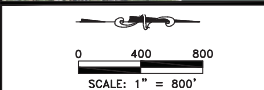
TIGERTAIL LAGOON RESTORATION PROJECT		
SUBMERGED ENVIRONMENTAL RESOURCES PLAN		
FOR: CITY OF MARCO ISLAND		
DATE: 8/18/21	FILE: PLAN	SCALE: SHOWN
JOB: 27-002	DATUM: NONE	FIGURE: SP-3

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FLUCFCS			
HATCH	CODE	DESCRIPTION	ACRES
	320	COASTAL SHRUB & BRUSH	33.0
	322	COASTAL SCRUB	1.2
	329	OTHER SHRUBS (COINVINE)	0.5
	426	TROPICAL HARDWOODS	27.0
	540	BAYS AND ESTUARIES	108.8
	612	MANGROVE	68.4
	642	SALTWATER MARSH	44.4
	911	SEAGRASS	35.3
	181	BEACH SAND	64.0
			382.6



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NOTE:
EMERGENT HABITAT MAPPING PREPARED BY TURRELL, HALL & ASSOCIATES (THA), AUGUST 2021.

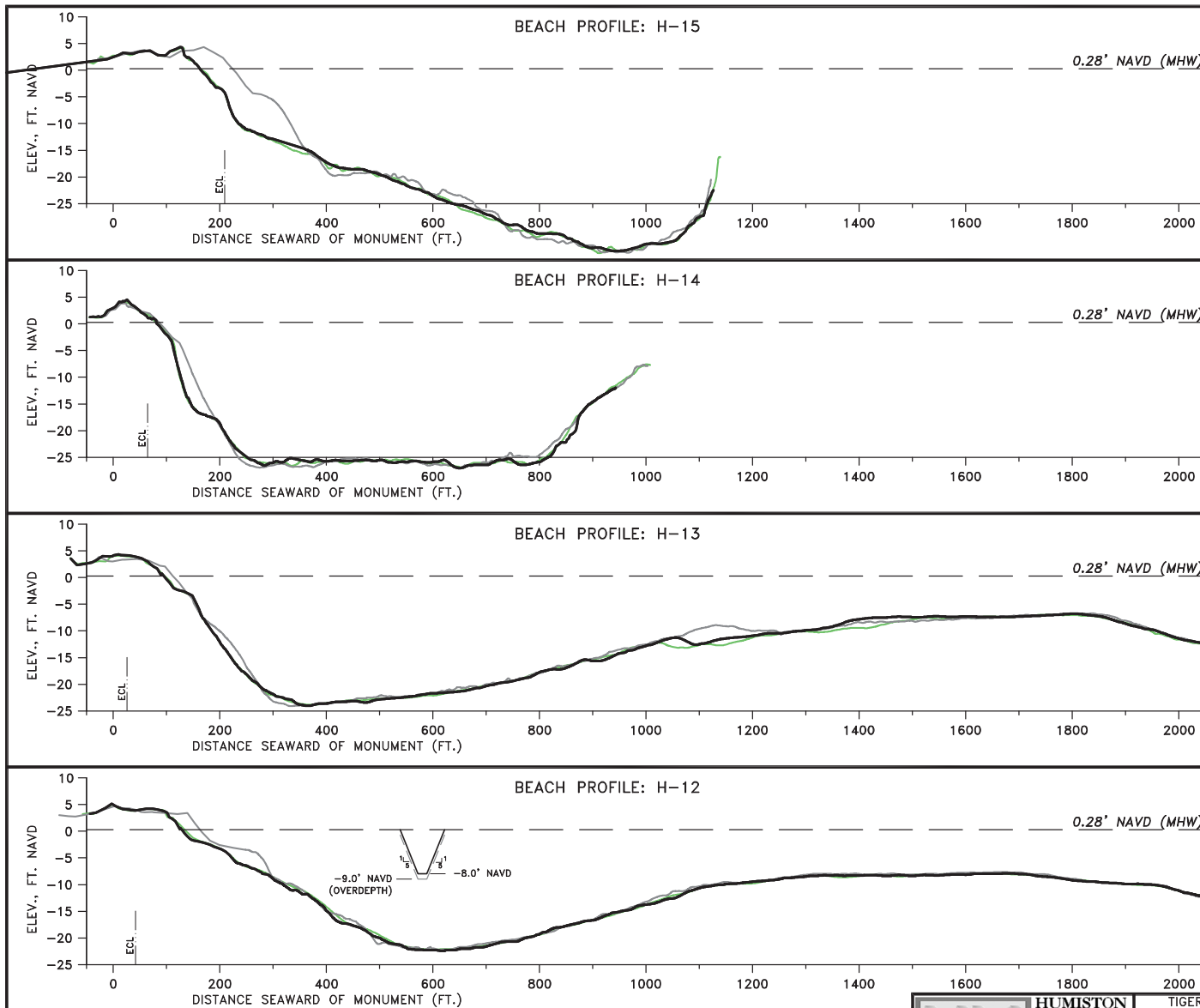


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TIGERTAIL LAGOON RESTORATION PROJECT
EMERGENT ENVIRONMENTAL RESOURCES PLAN
FOR: CITY OF MARCO ISLAND

DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
JOB: 27-002 DATUM: NONE FIGURE: SP-4

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LEGEND

- 2021-05 CEC SURVEY DATA
- 2020-05 CEC SURVEY DATA
- 2017-08 HIDEAWAY BEACH MONITORING
- SAND TRAP TEMPLATE
- SAND TRAP OVERDEPTH TEMPLATE
- DESIGN FILL TEMPLATE
- DESIGN CUT TEMPLATE

- NOTES:**
1. SUBMERGED RESOURCES BASED ON 2020 SURVEY BY TURRELL HALL & ASSOCIATES (THA).
 2. SAND TRAP DESIGN DEPTH: -8.0 FT. NAVD
ALLOWABLE 1 FOOT OVERDEPTH: -9.0 FT. NAVD
 3. INTERIOR FLOW CHANNEL:
NORTH END DESIGN: -8.0 FT. NAVD
ALLOWABLE 6 INCH OVERDEPTH: -8.5 FT. NAVD
MIDDLE SECTION DESIGN: -5.0 FT. NAVD
ALLOWABLE 6 INCH OVERDEPTH: -5.5 FT. NAVD
SOUTH DISTRIBUTION CHANNEL: -3.0 FT. NAVD
ALLOWABLE 6 INCH OVERDEPTH: -3.5 FT. NAVD

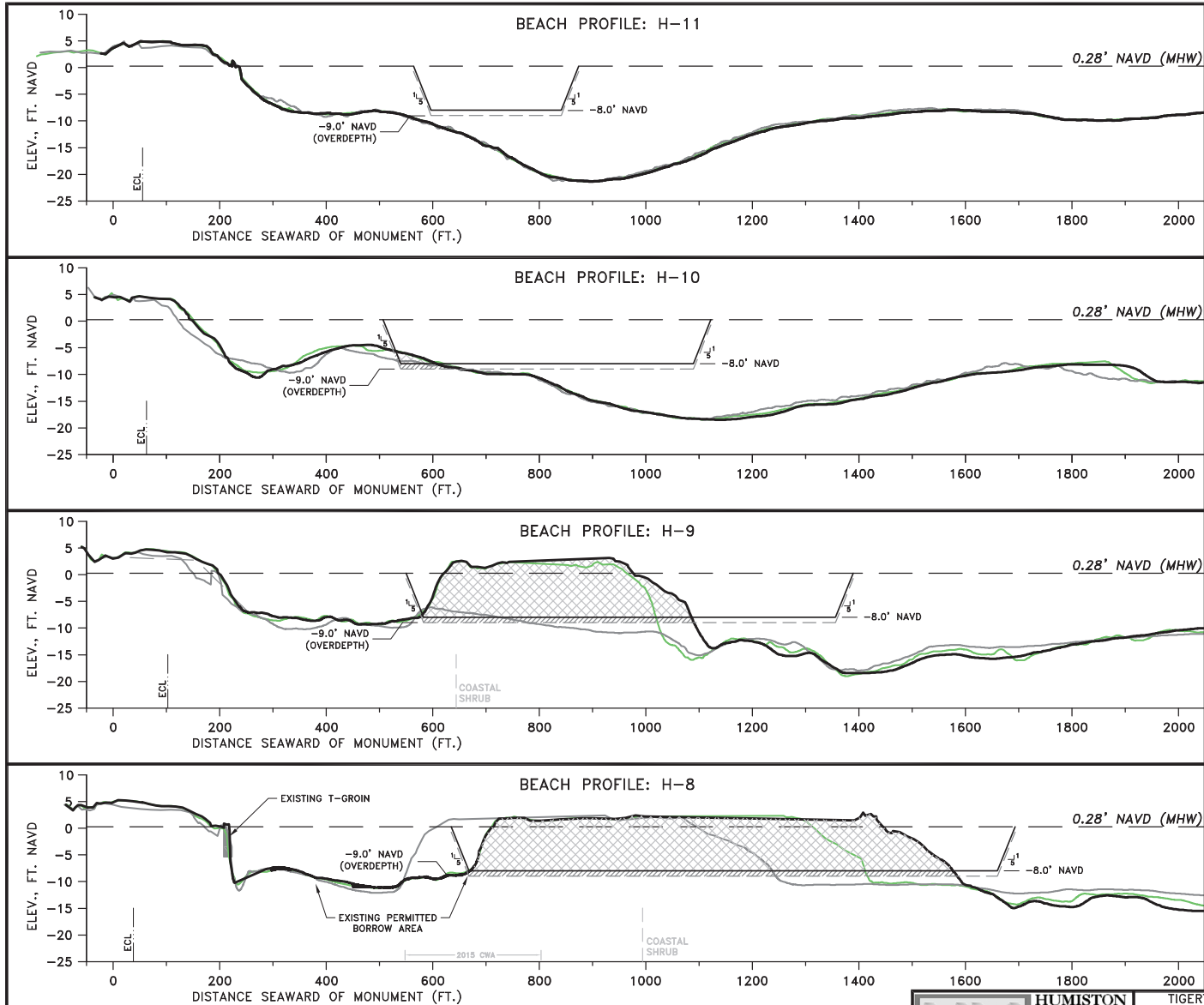
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NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H



TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - CROSS SECTIONS		
FOR: CITY OF MARCO ISLAND		
DATE: 8/18/21	FILE: PLAN	SCALE: SHOWN
JOB: 27-002	DATUM: NONE	FIGURE: XS-1

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LEGEND

- 2021-05 CEC SURVEY DATA
- 2020-05 CEC SURVEY DATA
- 2017-08 HIDEAWAY BEACH MONITORING
- SAND TRAP TEMPLATE
- SAND TRAP OVERDEPTH TEMPLATE
- DESIGN FILL TEMPLATE
- DESIGN CUT TEMPLATE

- NOTES:**
- SUBMERGED RESOURCES BASED ON 2020 SURVEY BY TURRELL HALL & ASSOCIATES (THA).
 SAND TRAP DESIGN DEPTH: -8.0 FT. NAVD
 ALLOWABLE 1 FOOT OVERDEPTH: -9.0 FT. NAVD
 - INTERIOR FLOW CHANNEL:
 NORTH END DESIGN: -8.0 FT. NAVD
 ALLOWABLE 6 INCH OVERDEPTH: -8.5 FT. NAVD
 MIDDLE SECTION DESIGN: -5.0 FT. NAVD
 ALLOWABLE 6 INCH OVERDEPTH: -5.5 FT. NAVD
 SOUTH DISTRIBUTION CHANNEL: -3.0 FT. NAVD
 ALLOWABLE 6 INCH OVERDEPTH: -3.5 FT. NAVD

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SAND TRAP			
MONUMENT	EFFECTIVE DISTANCE (FT)	CUT VOLUME (CY/FT)	VOLUME AVAILABLE (CY)
H-8	376	330.7	124,400
H-9	481	183.1	88,100
H-10	573	7.1	4,100
H-11	325	0.0	0
H-12	589	0.0	0
TOTALS (INCLUDING 1' OVERDEPTH):			216,600

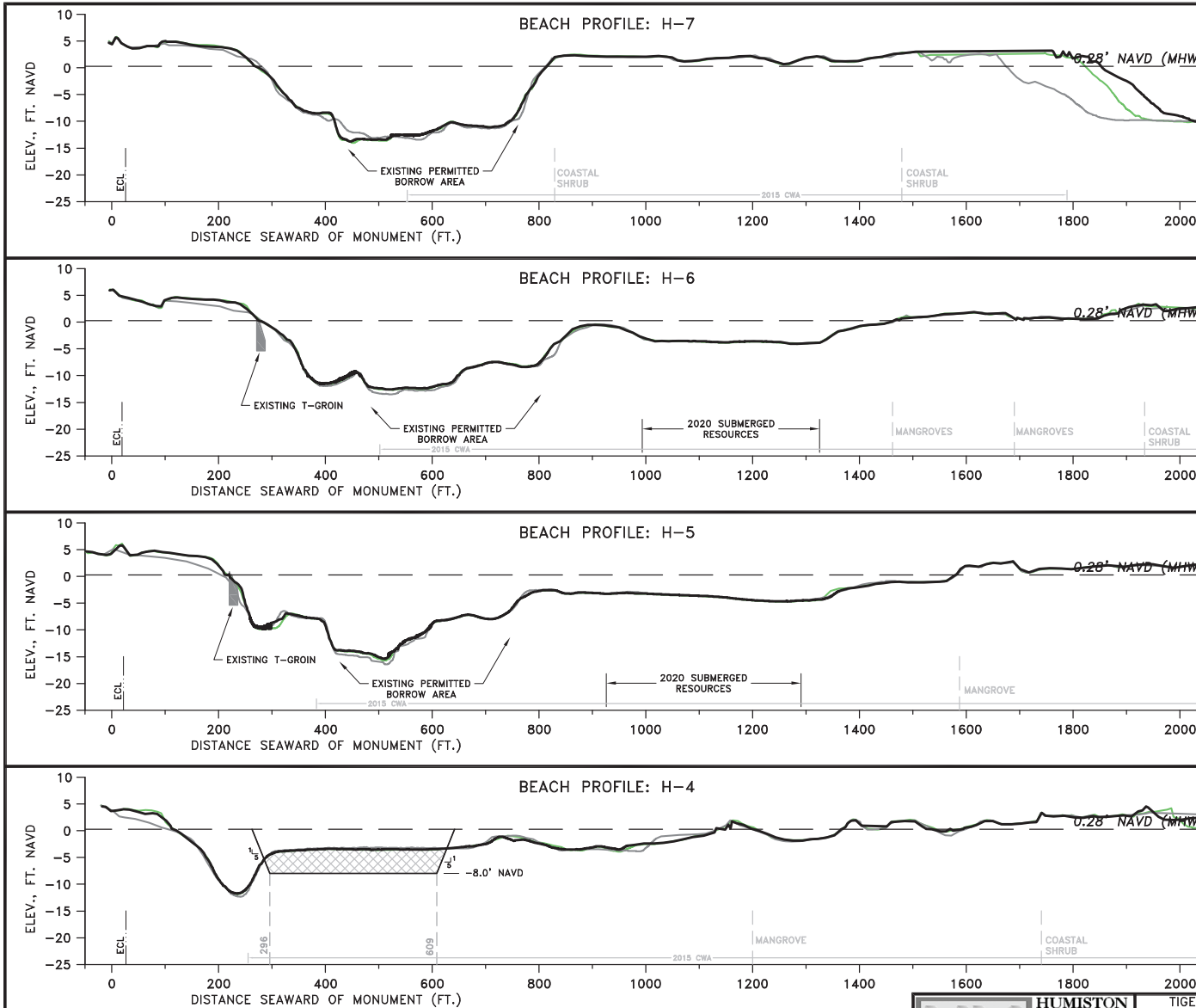
NOTE: BEACH SLOPES 1V:15H
 CHANNEL SLOPES 1V:5H



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TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - CROSS SECTIONS
 FOR: CITY OF MARCO ISLAND
 DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
 JOB: 27-002 DATUM: NONE FIGURE: XS-2

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LEGEND

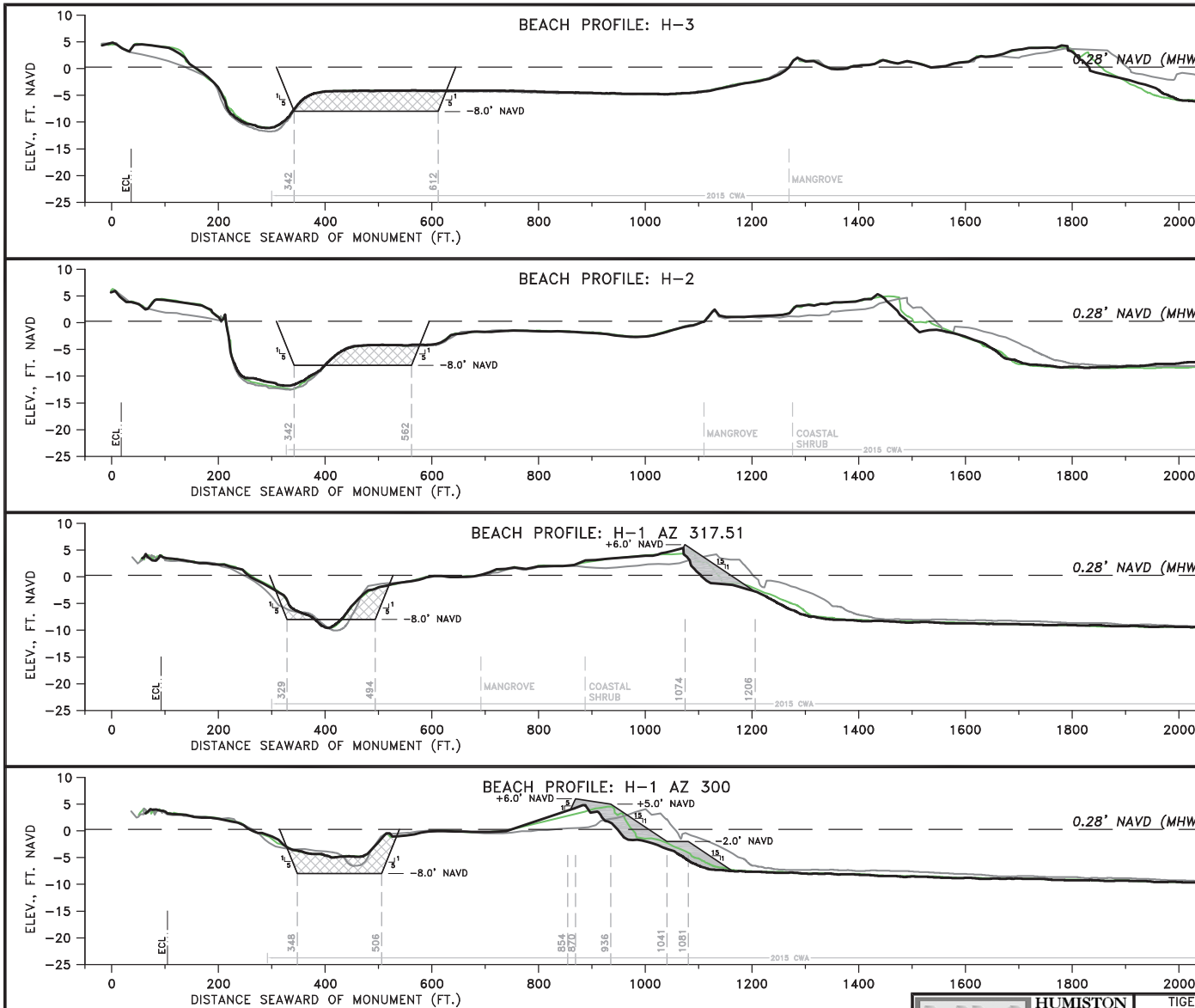
- 2021-05 CEC SURVEY DATA
- 2020-05 CEC SURVEY DATA
- 2017-08 HIDEAWAY BEACH MONITORING
- DREDGE TEMPLATE
- DESIGN FILL TEMPLATE
- DESIGN CUT TEMPLATE

- NOTES:**
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ALLOWABLE 1 FOOT OVERDEPTH: -9.0 FT. NAVD
 3. INTERIOR FLOW CHANNEL:
NORTH END DESIGN: -8.0 FT. NAVD
ALLOWABLE 6 INCH OVERDEPTH: -8.5 FT. NAVD
MIDDLE SECTION DESIGN: -5.0 FT. NAVD
ALLOWABLE 6 INCH OVERDEPTH: -5.5 FT. NAVD
SOUTH DISTRIBUTION CHANNEL: -3.0 FT. NAVD
ALLOWABLE 6 INCH OVERDEPTH: -3.5 FT. NAVD

FLOW CHANNEL - BORROW AREA			
MONUMENT	EFFECTIVE DISTANCE (FT)	CUT VOLUME (CY/FT)	VOLUME AVAILABLE (CY)
H-4	287	53.9	15,400
H-3	471	37.2	17,500
H-2	517	20.7	10,700
H-1 @ 317	325	15.5	5,000
H-1 @ 300	589	27.2	16,000
TOTALS:			64,600

NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H

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	COASTAL ENGINEERING DESIGN AND PERMITTING		FOR: CITY OF MARCO ISLAND	DATE: 8/18/21	
		SCALE: SHOWN	JOB: 27-002		DATUM: NONE
				FIGURE: XS-3	



LEGEND

- 2021-05 CEC SURVEY DATA
- 2020-05 CEC SURVEY DATA
- 2017-08 HIDEAWAY BEACH MONITORING
- DREDGE TEMPLATE
- DESIGN FILL TEMPLATE
- DESIGN CUT TEMPLATE

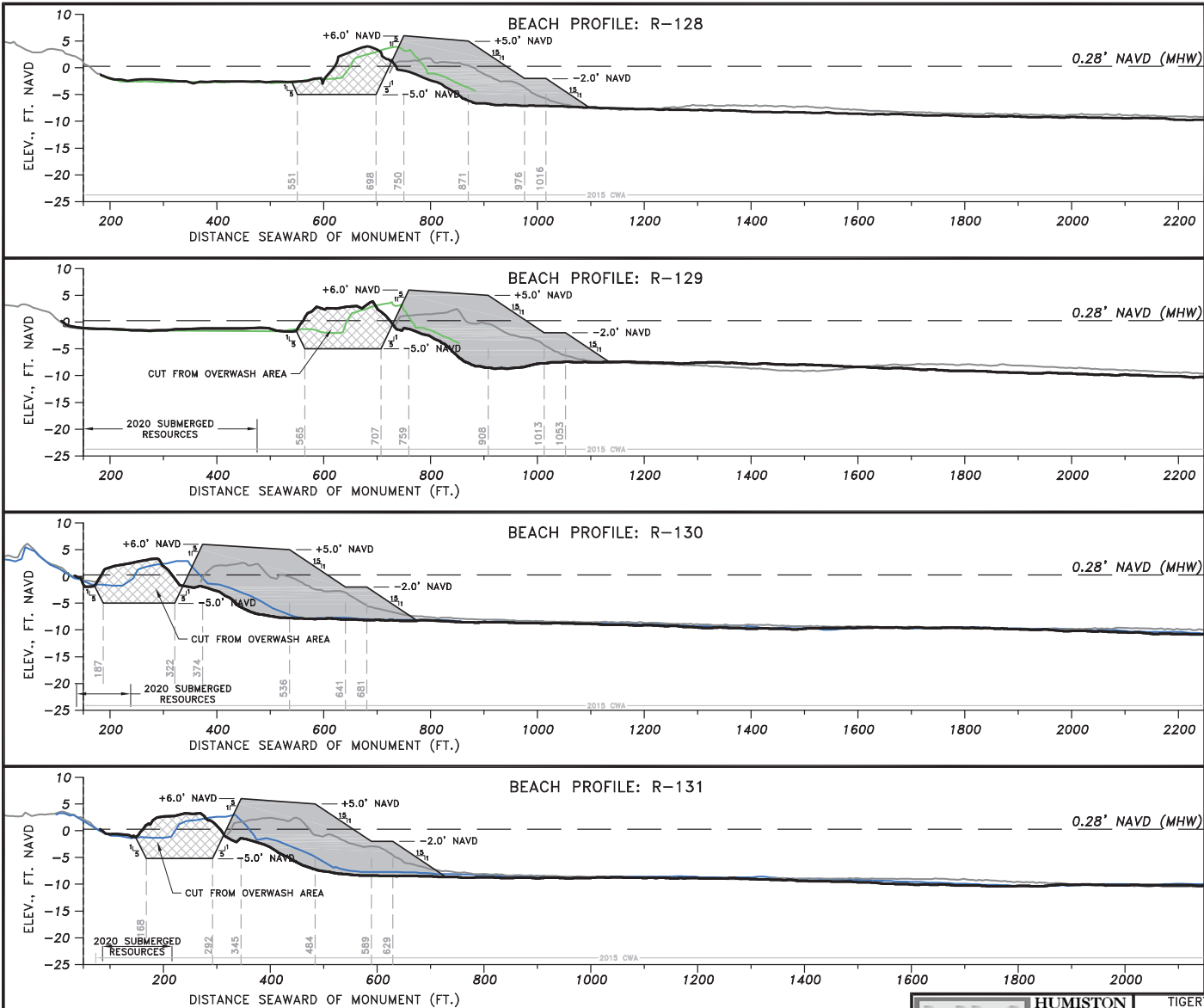
NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H

FLOW CHANNEL - BORROW AREA			
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H-1 @ 317	325	15.5	5,000
H-1 @ 300	589	27.2	16,000
TOTALS:			64,600

BERM FILL			
MONUMENT	EFFECTIVE DISTANCE (FT)	FILL DENSITY (CY/FT)	FILL VOLUME (CY)*
H-1 @ 317	481	11.7	5,600
H-1 @ 300	698	27.3	19,100
R-128	889	88.3	78,500
R-129	888	117.3	104,100
R-130	725	127.9	92,700
R-131	1253	112.7	141,100
R-132	1562	22.3	34,800
TOTALS:			475,900

* AT TIME OF 05/2021 SURVEY

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	FOR: CITY OF MARCO ISLAND		
DATE: 8/18/21	FILE: PLAN	SCALE: SHOWN	JOB: 27-002 DATUM: NONE FIGURE: XS-4



LEGEND

- 2021-05 CEC SURVEY DATA
- 2020-05 CEC SURVEY DATA
- 2020-04 SDI SURVEY DATA
- 2017-08 HIDEAWAY BEACH MONITORING
- DREDGE TEMPLATE
- DESIGN FILL TEMPLATE
- DESIGN CUT TEMPLATE

- NOTES:**
- SUBMERGED RESOURCES BASED ON 2020 SURVEY BY TURRELL HALL & ASSOCIATES (THA).
 - INTERIOR CHANNEL DEPTH: -5.0' NAVD, -5.5' NAVD OVERDEPTH
 - BEACH SLOPES 1V:15H (SEAWARD), 1V:5H (LANDWARD)
 - CHANNEL SLOPES 1V:5H

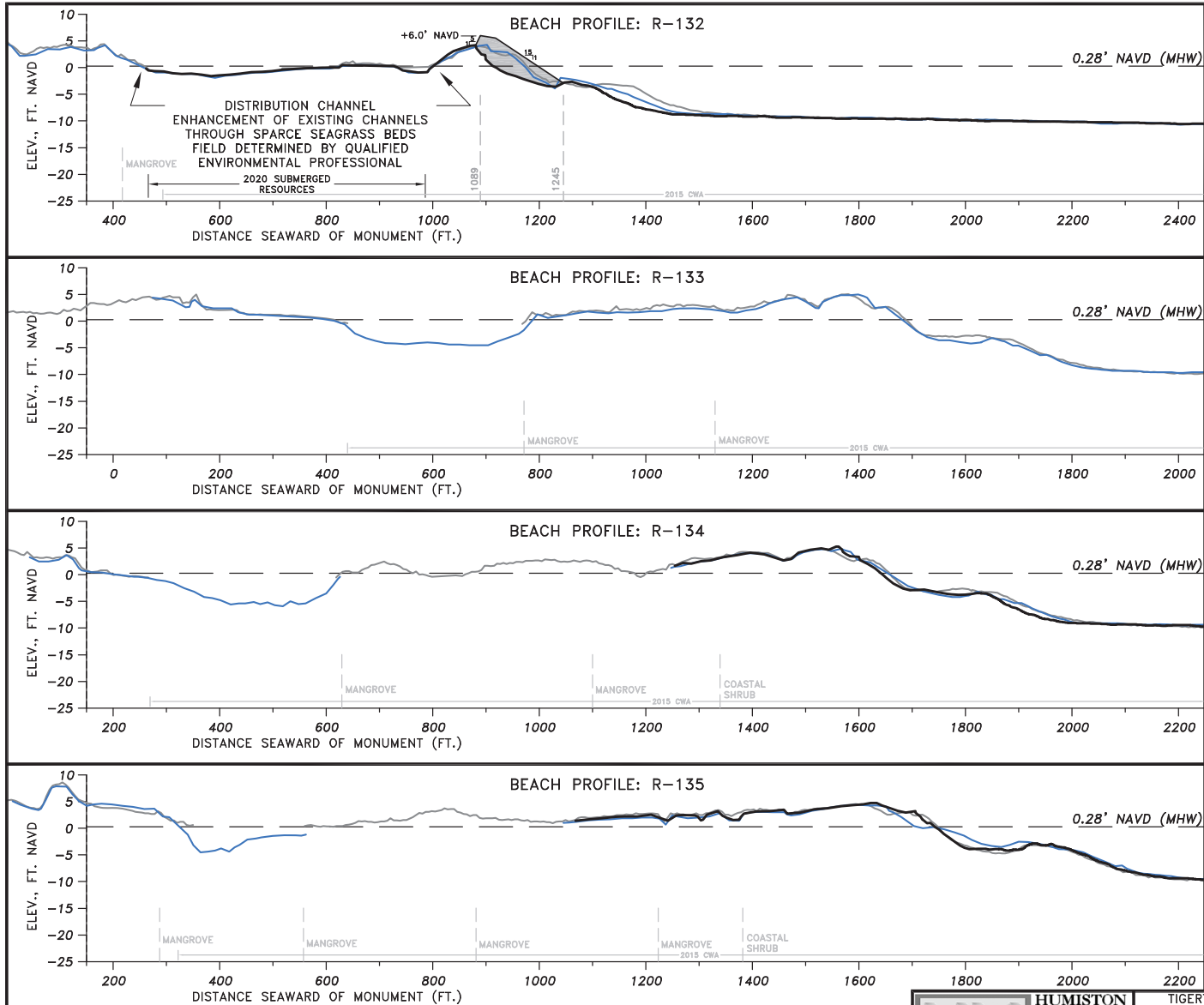
BERM FILL			
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R-130	725	127.9	92,700
R-131	1253	112.7	141,100
R-132	1562	22.3	34,800
TOTALS:			475,900

* AT TIME OF 05/2021 SURVEY

FLOW CHANNEL - BEHIND BERM			
MONUMENT	EFFECTIVE DISTANCE (FT)	CUT BOTTOM ELEVATION -5' (CY/FT)	CUT VOLUME AVAILABLE -5' (CY)
R-128	812	36.1	29,400
R-129	888	45.2	40,100
R-130	725	38.9	28,100
R-131	1190	41.1	48,900
TOTALS:			146,500

NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H

<p>HUMISTON & MOORE ENGINEERS COASTAL ENGINEERING DESIGN AND PERMITTING</p>	TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - SPIT CROSS SECTIONS		5679 STRAND COURT NAPLES, FL 34110 FAX: (239) 594-2025 PHONE: (239) 594-2021 www.humistonandmoore.com
	FOR: CITY OF MARCO ISLAND		
	DATE: 8/18/21	FILE: PLAN	
JOB: 27-002		DATUM: NONE	FIGURE: XS-5



LEGEND	
	2021-05 CEC SURVEY DATA
	2020-04 SDI SURVEY DATA
	2017-08 HIDEAWAY BEACH MONITORING
	DESIGN FILL TEMPLATE

- NOTES:
- SUBMERGED RESOURCES BASED ON 2020 SURVEY BY TURRELL HALL & ASSOCIATES (THA).
 - BEACH SLOPES 1V:15H (SEAWARD), 1V:5H (LANDWARD)
 - DISTRIBUTION CHANNEL WIDTH: 20 FT., OR LESS.

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	DATE: 8/18/21	FILE: PLAN	
JOB: 27-002		DATUM: NONE	FIGURE: XS-6