



Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project

Project information in support of The City of Marco Island request for supplemental funding from Collier County

January 2023

Abstract

This report is provided in support of the City of Marco Island request to Collier County for supplemental funding for the Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project.

This is a permitted and awarded project of the City of Marco Island that is currently under construction. Due to the impacts of Hurricane Ian supplemental funds are required to complete the restoration project as designed.

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I. Introduction

This report is provided in support of the City of Marco Island request to Collier County for supplemental funding through Tourist Development Council (TDC) to the project: *Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project*. This report is provided as a follow up to the informational meeting and materials presented at the December 2022 Collier County Coastal Advisory Committee meeting. The project which aims to restore impacts from Hurricane Irma, and improve coastal resiliency, water quality and stability of Tigertail Lagoon and Sand Dollar Island is in public interest while providing environmental and recreational benefits. This is a permitted and awarded city project that is currently under construction, and due to the impacts of Hurricane Ian supplemental funds are required to complete the restoration project. The project TDC funding request is for assistance relating to increased project costs due to impacts from Hurricane Ian. The information herein is provided for additional clarity on the benefits of the project as support to local tourism and continued public use of the county park and areas enhanced by this project.

II. Project Overview

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. 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 a portion of the sand spit seaward of its present location to where it was located in approximately 2017. **Figure 1** illustrates the project elements and main features including the protective beach berm, sand trap and flow channel.

- **Protective beach berm:** The constructed beach berm will provide enhanced resiliency to high frequency weather events protecting the lagoon, the critical wildlife area and maintain public access to the pristine beach and wildlife of this unique environmental and recreational tourist attraction.
- **Sand Trap:** the sand trap at the north end of Sand Dollar Island is the main source of sediment that will also 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.
- **Flow Channel:** the project includes establishing a flow channel that connects the south part of the lagoon at Tigertail Beach Park to the north part of the lagoon to maintain tidal flow and improve water quality and public safety.

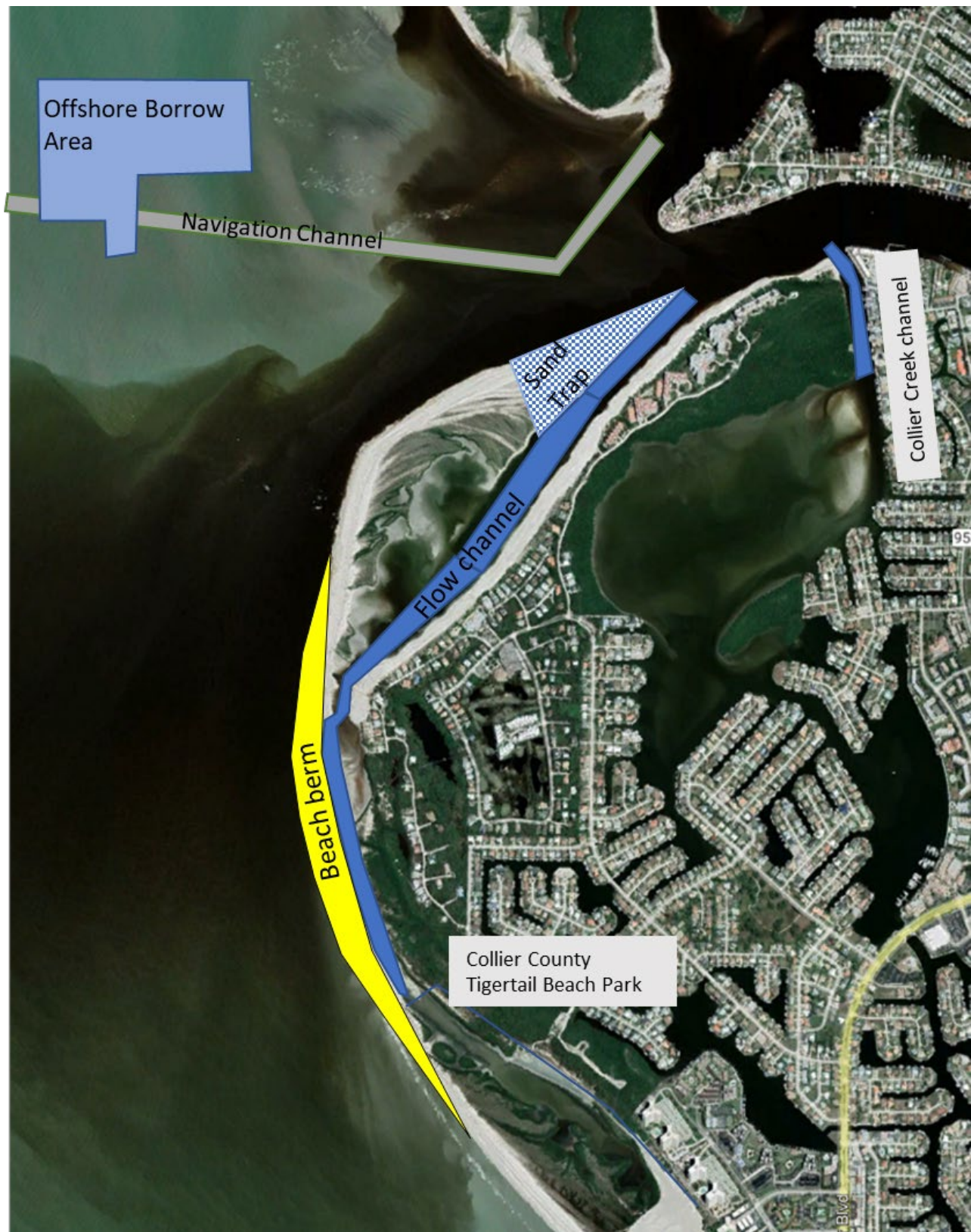


Figure 1. Tigertail Lagoon/ Sand Dollar Island Ecosystem Restoration project features

- **Regional sand management:** the project also provides improved and sustainable regional sand management for adjacent inlets at the north part of Marco Island. The sand trap is designed to reduce shoaling rates at the entrance to lagoon and may also reduce shoaling rates at the entrance to Collier Creek. The Sand Dollar Island beach berm will also provide a sustainable disposal area for maintenance dredging of the entrance Collier Creek in lieu of the offshore borrow area which has limited capacity and intersects with the Capri Pass Navigation Channel (**Figure 1**).

III. Public interest and recreational benefits

Tigertail Lagoon and Sand Dollar Island are valuable Marco Island and Collier County recreational resources for residents and tourists for birding, fishing, kayaking, paddle boarding, kitesurfing, and boating.

A. Access

The project in its entirety is located on public beach and wetland areas designated as Critical Wildlife Area by the State of Florida and can only be accessed by land through the Collier County Tigertail Beach Park at the south part of the system. Tigertail Beach Park 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. In addition, an increasing number of private, rental, and commercial tourist boats access the lagoon from its northern entrance.



Figure 2. Tigertail Beach Park access to the Critical Wildlife Area

B. Tigertail Beach Park: Project development and benefits

The Tigertail Lagoon portion within the County Park constitutes approximately 30 % of the total lagoon area. **Figure 2** shows a map of Tigertail Lagoon /Sand Dollar Island Critical Wildlife Area and the Park as part of this system. **Figure 3** shows the features and attractions of the County Park as listed on the park entrance sign including shore bird watching, lagoon and beach recreational activities. These recreational features are threatened due to the system degradation since Hurricane Irma in 2017 and near collapse following Hurricane Ian in 2022.

The system degradation and concerns of the park visitors were echoed by the actions of the Friends of Tigertail (FOT), a 501-C3 entity with a mission to preserve and protect the Tigertail Beach area of Collier County. FOT reached out to Collier County, City of Marco and others raising concerns about the park conditions and requesting attention and assistance to restore the lagoon post Hurricane Irma. Several public meetings with all stakeholders including Collier County were led by FOT and held in 2019 and 2020. The City of Marco Island through funding from Hideaway Beach Tax district initiated the project permitting later in 2020. A pre-application meeting with permitting agencies and all stakeholders was held in January 2021 including representatives from various departments and management of Collier County. The City of Marco Island filed permit applications in April 2021. 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. A detailed timeline of the project is enclosed, **Appendix A**.

Figure 3 also illustrates the park access and pathways to the gulf shoreline of Sand Dollar Island fronting the park area. The figure also shows the severe erosion along the park gulf shoreline which was further impacted by Hurricane Ian in September of 2022.

The Tigertail Beach Park 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 top panel of **Figure 4** shows the post Hurricane Ian conditions showing the severe erosion of the gulf shore of the northern part of the park, the shoaling and collapse of the middle part of sand dollar island, and the loss of flow connectivity to the northern part of the lagoon. All threatening to diminish the value of the main features of the park.

The bottom panel of **Figure 4** shows the project benefits including reestablishing tidal flow to the lagoon through the flow channel and establishing a protective beach berm that not only will maintain beach access to park visitors but also protect the flow channel from frequent shoaling and closure. The project design includes approximately 100,000 CY over approximately ½ mile at the Gulf shoreline of the park. The project benefits also include environmental and water quality monitoring including installation of a tidal flow and water quality monitoring station in the park lagoon.



Tigertail beach Park sign illustrating the Park features and tourist attractions



Public access pathways to gulf beach where the shoreline has retreated significantly and undermined dune



Park shoreline where the eroding beach is further impacted by Hurricane Ian

Figure 3. Tigertail Beach Park features and existing conditions (December 2022)



Existing conditions post Hurricane Ian at Tigertail Beach Park (October 2022)



Project improvements at Tigertail Beach Park

Figure 4. Existing conditions and improved conditions post construction at Tigertail Park

C. State determination on project's public interest and recreational benefits

As part of the State Department of Environmental Protection (DEP) review and processing of state JCP permit 0401778-001-JC, the technical environmental and coastal engineering staff and the program administrative staff have determined that the project is in the public interest and maintain access to environmental and recreational benefits to the public. The following points provide summary findings from documentation and statements from Intent to Issue by DEP.

- The overwash and shoaling along the middle section of Sand Dollar Island and Tigertail Lagoon is causing loss of lagoon habitat.
- The proposed project may ***reduce potential for adverse impacts to public health, safety and welfare*** should the lagoon become stagnant.
- The proposed project ***will allow for continued use of the area by the public for wildlife observation and other recreation uses.***
- The project will have a net positive benefit to the coastal system.
- The project is in the ***public interest providing environmental, social and economic benefits and provide more storm protection.***
- The project is expected to ***maintain this area as an environmental and recreational resource to the public.***
- The project meets the ***Department criteria for public interest determination.***

Figure 5 provides excerpts from DEP Intent to issue document establishing those findings. The complete document is enclosed in **Attachment B**

Florida Department of Environmental Protection

December 21, 2021

Tigertail Lagoon / Sand Dollar Island Ecosystem Restoration Project

Notice of Intent to Issue Joint Coastal Permit and Authorization to use Sovereign Submerged Lands**Background (bottom of pg 3):**

Storm events leading to overwash of the central segment of Sand Dollar Island and shoaling of the mid-section of Tigertail Lagoon is causing loss of lagoon habitat.

(Top paragraph pg 4)

The proposed project will result in restoring and enhancing aquatic and upland habitats within the coastal ecosystem of the Tigertail Lagoon / Sand Dollar Island (TLSDI) system that have deteriorated over time.

(Public Health, Safety or Welfare middle of pg 8)

The proposed ecosystem restoration project may reduce the potential for adverse impacts to public health, safety or welfare to occur, should the lagoon become stagnant.

(Recreational benefits bottom of page 8)

The restoration and maintenance of the TLSDI will allow continued use by the public for observation of wildlife, sunbathing, swimming, surfing, recreational fishing and related activities.

Florida Administrative Code (Rule) requirement (pg 11)

Rule 62B-41.005(2), F.A.C. coastal construction authorized by the Department shall have a net positive benefit to the coastal system.

Sovereign Lands Requirements (pg 12)

Pursuant to Rule 18-21.003(53), F.A.C., The proposed project would be in the public interest because the activity provides demonstrable environmental, social, and economic benefits, by maintaining a navigable waterway, and providing more storm protection, without causing any significant environmental harm.

(and top of pg 13)

The proposed project is expected to maintain this environmental and recreational resource so that the public may continue to enjoy traditional uses of the TLSDI system, including but not limited to, boating, fishing, and swimming. Removing the overwashed sand from the lagoon will restore natural habitat and return the biological and recreational value of the area.

Public Interest (top of pg 15)

After weighing the effects of the project for each of the public interest criteria specified in Section 373.414(1), F.S., and the Environmental Resource Permit Application Handbook, Volume 1, 10.2.3., and based on reasonable assurance provided by the Applicant, the Department has determined that the proposed activity is clearly in the public interest.

The full document is enclosed as Attachment B

Figure 5. Excerpts from the State Intent to issue establishing Projects Public interest and benefits

IV. Hurricane Ian Impact

The City of Marco Island awarded the project to Ahtna Marine & Construction Company in September 2022 for a total of \$3.3 million prior to Hurricane Ian. Hurricane Ian impacted Collier County and the project area on September 28, 2022, resulting in additional onshore migration and overwash of the sand spit protecting the lagoon. Preconstruction surveys in October 2022 documented conditions post Hurricane Ian and were used to produce updated construction plans. Hurricane Ian caused a reduction in available sediment and an increase in required sediment to construct the beach berm. Sediment from an existing offshore borrow area authorized within the project permit as a contingency sand source will need to be utilized to supplement the project construction and achieve the designed beach berm.

V. Project Construction Costs and County Funding Request

The City of Marco Island awarded the project to the contractor Ahtna Marine & Construction Company in September 2022 for a total of \$3.3 million. Ahtna Marine & Construction Company prepared a proposal to the city for change order consideration to obtain the additional 85,000 cubic yards (CY) from the offshore borrow area which is authorized by the project permit. The availability of the contractor on site and the need for the additional volume of sand presents an opportunity to construct the protective beach berm to its design template in a cost-effective manner including addressing impacts of Hurricane Ian. The contractor's proposal is included with the draft Change Order from the City of Marco Island enclosed as **Attachment C**.

Available funds including project contingencies could only cover the mobilization to the offshore borrow area and dredging a base amount of 25,000 cubic yards for placement on Sand Dollar Island. The City of Marco Island is requesting \$650,400 to obtain the remaining 60,000 cubic yards of sand from the permitted offshore borrow area at a cost of \$10.84/CY and placement on Sand Dollar Island. The unit cost of \$10.84 /CY as proposed by the contractor is lower than the cost of past hydraulic dredging in Collier County or the region for similar type work. This sand will be used to complete constructing the protective berm on Sand Dollar Island as designed and address the impact of Hurricane Ian. The constructed berm will provide storm protection for the newly reopened flow channel connecting the southern lagoon at the County Park with the northern lagoon/gulf entrance, the associated Critical Wildlife Area, and the upland development.

Constructing the Sand Dollar Island protective berm with significantly less volume than the design volume puts the system at higher risk for storm impacts and need for future maintenance sooner than planned. In addition, the cost of a near future maintenance project would be expected to be much higher than the cost proposed at this time with a contractor already on site.

VI. Monitoring and Mitigation

The City of Marco Island and Hideaway Beach Tax District are the project owner and plan to conduct monitoring required for the project. The project design did not require any mitigation. This request does not include funds for monitoring or mitigation.

VII. Project Plans, Permits, etc.

Project permit plans and listing of permits are enclosed as **Attachment D**

VIII. Summary

The Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration project is a City of Marco Island project designed to restore and protect a valuable ecosystem, recreational assets, and tourist attractions. The project incorporates improvements to aquatic and upland habitat while preserving and enhancing the resiliency of the natural system. The Florida Department of Environmental Protection in their permit review process determined that the project is in the public interest providing environmental, social and economic benefits and added storm protection. The project directly benefits Collier County Tigertail Beach Park in 4 main areas

- 1- **Direct access to the gulf shoreline.** Tigertail Beach Park represents one of the main public beach access points in Collier County and Marco Island in particular. At present the direct gulf shoreline at the north part of the Park has severely retreated in past few years with significant impacts post Hurricane Ian. Present conditions post Ian left no dry beach between the gulf and dune vegetation. This part of the Park gulf shoreline will be restored providing dry recreational beach and continuous access to the pristine shoreline of Sand Dollar Island which represents one of the main tourist attractions to this Park.
- 2- **Water recreational activities.** By restoring the 2-mile-long tidal lagoon, over water activities along the lagoon including kayaking, paddleboarding and other water recreational activities can resume.
- 3- **Bird watching.** One of the main attractions at the Park is bird watching. Restoring the ecosystem will maintain that function and prevent degradation of this attraction into the future.
- 4- **Water quality and public safety.** Restoring the tidal flushing of the lagoon at the park will help improve water quality and reduce public safety hazards.

The Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project design, permitting and construction window immediately post Hurricane Ian provided a timely opportunity to restore a system that otherwise was in rapid collapse. The additional funds requested from Collier County will provide direct public benefits that clearly encourage tourism within Collier County.

IX. Attachment A. Project Timeline

Tigertail Lagoon / Sand Dollar Island Ecosystem Restoration Project Timeline

- The project started with a feasibility study initiated by the City of Marco Island's Hideaway Beach Tax District in 2017 and completed in 2018. This study documented the impacts of Hurricane Irma and provided recommendations to engage all stakeholders to discuss system degradation and evaluate restoration alternatives. At the time, the Tax District thought that such a regional project to address the entire system was beyond its capabilities to permit, fund, and execute alone. They were also told by County staff that successful permitting would be very unlikely as the work was in the Big Marco Pass Critical Wildlife Area.
- As a result, in 2019 Friends of Tigertail initiated and organized follow up discussions and public meetings with stakeholders and they included City of Marco Island, Collier County, FWC, and Audubon.
- In July 2020 Friends of Tigertail made a presentation to inform the CAC on the deteriorating conditions and need for a restoration project.
- In the Fall of 2020 as the system continued to deteriorate, Hideaway Beach re-engaged HM to develop a restoration plan and coordinate with stakeholders and agencies including the city, county, DEP, FWC, USACE, NOAA NMFS, FWS, Rockery Bay, and Audubon.
- In January of 2021 Marco Island City Council unanimously supported pursuing permits to restore the system of Sand Dollar Island and Tigertail Lagoon.
- Pre application meetings and coordination with all stakeholders, including Collier County, including Parks and Recreation, Coastal Zone Management, and administration in January 2021
- Permit applications on behalf of the City of Marco Island were submitted in April of 2021.
- Commissioner LoCastro organized two Action Committee meetings of all stakeholders in mid-2021 and early 2022 to get feedback on what should be done to address the conditions in the lagoon.
- Permits by FDEP, USACE and FWC were issued between February 2022 and July 2022.
- Marco Island City Council unanimously supported project construction and awarded the project to the selected contractor in September 2022. Project funding was provided by the City of Marco Island's Hideaway Beach Tax District.
- In late September 2022 Hurricane Ian impacted the region and the project area.
- Project construction started in November 2022 and Commissioner LoCastro organized another County and stakeholder meeting to review the project timeline.
- Post Ian physical surveys were completed and, in December 2022, the City requested County funding support to supplement project construction because of Hurricane Ian impacts and additional sand volume needed to build the protective berm to design standards and to source that sand from off-shore.

X. [Attachment B. FDEP Intent to Issue document \(December 2021\)](#)



FLORIDA DEPARTMENT OF Environmental Protection

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Secretary

In the Matter of an
Application for Joint Coastal Permit and
Authorization to Use Sovereign Submerged Lands by:

APPLICANT:

City of Marco Island
Attn: Tim Pinter
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Marco Island, FL, 34145
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AGENT:

Humiston & Moore Engineers
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Naples, FL 34110
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PROJECT INFORMATION:

Project Name: Tigertail Lagoon / Sand
Dollar Island Ecosystem Restoration Project

File No.: 0401778-001-JC

County: Collier

CONSOLIDATED NOTICE OF INTENT TO ISSUE JOINT COASTAL PERMIT AND AUTHORIZATION TO USE SOVEREIGN SUBMERGED LANDS

The Department of Environmental Protection (Department) gives consolidated notice of its intent to take the following agency actions:

- (a) issue a 15-year joint coastal permit (draft copy attached), under Chapter 161 which includes consideration of the provisions of Part IV of Chapter 373, Florida Statutes (F.S.), and Title 62, Florida Administrative Code (F.A.C.) for the activity described below;
- (b) grant a letter of consent to use sovereign submerged lands for the proposed channel dredge areas and the sediment disposal area, under Article X, Section 11 of the Florida Constitution, Chapters 253 and 258, F.S., Title 18, F.A.C., and the policies of the Board of Trustees, as described below; and

Consolidated Notice of Intent to Issue

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- (c) grant a public easement to use sovereign submerged lands for the proposed sand trap, under Article X, Section 11 of the Florida Constitution, Chapters 253 and 258, F.S., Title 18, F.A.C., and the policies of the Board of Trustees, as described below subject to any fees or special easement conditions in the Recommended Proprietary Action document (entitled *Delegation of Authority*). .

Issuance of the joint coastal permit (JCP) would constitute a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act. Issuance of the JCP would also constitute certification of compliance with state water quality standards pursuant to Section 401 of the Clean Water Act, 33 United States Code (U.S.C.) 1341

I. PROPOSED ACTIVITY

A. Project Description

The proposed project is to establish a flow channel within the overwashed and shoaled areas of the Tigertail Lagoon and to restore the gulf-fronting shoreline of Sand Dollar Island using sediment hydraulically dredged from the flow channel and a sand trap at the north end of the island.. Additional sediment for berm placement may be sourced from the Hideaway Beach Nearshore and Offshore Borrow Areas.

The proposed flow channel will have maximum allowable depth of -8.5 feet NAVD (in the north) and -5.5 feet NAVD (in the middle) and will not directly impact submerged aquatic vegetation (SAV). The proposed Sand Trap will have a maximum allowable depth of -9.0 feet NAVD. The proposed design berm will be approximately 150 feet wide with a 1H:15V (horizontal:vertical) sloped beach face and a submerged berm near Mean Lower Low Water (MLLW).

The southern portion of the proposed flow channel, also called the distribution channel, is not authorized and will require a permit modification because its final dimension or configuration will be dependent upon conditions at the time of construction.

The activity includes consideration of an application for a 15-year sovereign submerged lands easement (No. 42667) containing 26.13 acres, more or less, for the proposed sand trap.

The activity will also require an Incidental Take Authorization from Florida Fish and Wildlife Conservation Commission for its potential impact to state listed bird species.

B. Project Location

Consolidated Notice of Intent to Issue**File No. 0401778-001-JC****Tigertail Lagoon / Sand Dollar Island Ecosystem Restoration Project****Page 3 of 20**

The proposed project is located on Marco Island, Collier County, Sections 5, 6, and 7, Township 52 South, Range 25 and 26 East, in and adjacent to Class III Waters of the Gulf of Mexico. The proposed flow channel is located in Tigertail Lagoon between H-4 and R-132. The proposed sand placement site is located on Sand Dollar Island between H-2 and R-133. The proposed sand trap is located at the northern end of Sand Dollar Island, adjacent to Tigertail Beach between H-7 and H-12. A portion of the proposed sand trap is located within Outstanding Florida Waters of Rookery Bay Aquatic Preserve.

II. AUTHORITY FOR REVIEW

The Department has permitting authority under Chapter 161, which includes consideration of the provisions of Part IV of Chapter 373, F.S., and Chapters 62B-41, 62B-49 and 62-330, F.A.C. The activity is regulated under the JCP program, as indicated in Sections 161.055 and 373.427, F.S. Pursuant to Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing this application.

The activity also requires a proprietary authorization, as it is located on sovereign submerged lands, which are owned by the Board of Trustees of the Internal Improvement Trust Fund. The activity is not exempt from the need to obtain a proprietary authorization. Pursuant to Article X, Section 11 of the Florida Constitution, Sections 253.002 and 253.77, F.S., Sections 18-21.0040, 18-21.0051, 18-20.002, 62-330.075 and 62B-49.001, F.A.C., the policies of the Board of Trustees, and the Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department has the responsibility to review and take final action on this request for proprietary authorization.

III. BACKGROUND/BASIS FOR ISSUANCE**A. Background Information**

Sand Dollar Island is a narrow low lying semi-enclosed peninsular, which was formed as result of the long term migration of the Big Marco Pass ebb shoal east towards the mainland and eventually attaching to Marco Island at its southern end. The Tigertail Lagoon /Sand Dollar Island system (TLSDI) consists of a tidal lagoon that was formed behind the peninsular at the south end (Tigertail Lagoon) with the mouth of the system at Hideaway Beach and Big Marco Pass at the north end. The lagoon is connected to the Gulf of Mexico by a narrow flow channel that runs between Marco Island and Sand Dollar Island.

Over time the spit has been reshaped by storm events and general wave hydrodynamics resulting in frequent overwash of the central segment, landward migration of the mouth and shoaling of Tigertail Lagoon. These events have led to the systematic reduction of the width of the mid-section of the lagoon, causing severe restrictions to tidal flow, which is causing loss of lagoon habitat.

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To prevent the attachment of Sand Dollar Island to the mainland, which could result in a stagnant lagoon system, the entrance to the TLSDI system at Big Marco Pass, is periodically dredged under Permit No. **0309260-010-JM** (the Hideaway Beach Nearshore Borrow Area). This proposed project will further enhance the flushing of the lagoon by establishing the flow channel; minimizing overwash and shoaling by restoring and maintaining the berm at a pre-Irma configuration; and further minimize the rate of landward migration of the spit by creating and maintaining the sand trap. Thus, restoring and enhancing aquatic and upland habitats within the coastal ecosystem of TLSDI that have deteriorated overtime.

B. Habitats

Hardbottom/Coral Reef

Surveys conducted in 2018 and 2020 for the Hideaway Beach Nourishment and Groins project (File No. 0309260-010-JM) documented small sponges and octocorals growing on shell hash substrate adjacent to the proposed sand trap (i.e., adjacent to the nearshore borrow area between H-6 and H-7, and near H-12,). The project is not expected to directly impact hardbottom resources and secondary impacts are not predicted to occur.

Submerged Aquatic Vegetation

Surveys in 2017, 2018, and 2020, showed that submerged aquatic vegetation (SAV) in the project area consists mostly of *Halodule wrightii*, with some *Halophila decipiens*. Several genera of macroalgae (e.g., *Caulerpa* spp. and *Penicillus* spp.) were observed as well. SAV in the northern portion of the project has been monitored previously for the Hideaway Beach Nourishment and Groins project (File No. 0309260-010-JM). Recent SAV surveys conducted in 2020 and 2021 included the SAV habitat along the interior of Sand Dollar Island from the mouth of the system at Hideaway Beach (H-12) to the southern end of Tigertail Lagoon (R-135). In 2020, the SAV bed between H-4 and H-7 was predominately composed of *H. wrightii* and *H. decipiens*. Historically, SAV has been documented in the proposed flow channel dredge area between H-1 and H-4; however, surveys conducted in 2020 and 2021 did not find any benthic resources within this portion of the dredge template.

In 2021, sparse coverage (0-15%) of SAV was present east of the proposed flow channel dredge template between R-128 and R-130. Between R-129.5 and R-131.5, the areal extent of SAV has been receding over recent years as the Sand Dollar Island migrates landward. Moderate to dense coverage (25-100%) of SAV was observed between R-131 and R-133. In southern Tigertail Lagoon, SAV beds were present in 2018, 2020, and 2021 surveys along the shallow perimeter of the lagoon; in 2021, these beds ranged in coverage from sparse (0-24%) to dense (50-85%).

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Realigning the barrier island to 2017 conditions and further opening the waterway behind the Sand Dollar Island is proposed to increase flushing and prevent Tigertail Lagoon from being closed off from the surface waters of the Gulf via the northern lagoon. Dredging of the flow channel restoration area will be limited to the over-washed area to avoid SAV resources. Furthermore, the narrow distribution channel proposed from R-131.5 to R-133 would be hand dug/dredged to ensure SAV resources in this area are avoided to the maximum extent practicable.

Though the project is not expected to directly impact SAV and secondary impacts are not predicted to occur, the proximity of SAV habitat to the proposed flow channel dredge template indicates these resources are within areas potentially under the influence of the project. As such, the permit will require SAV to be monitored to provide the Department with reasonable assurance that any unpermitted project-related impacts to resources will be documented if they occur. Pre-construction monitoring will be required to document current distribution of benthic resources within the influence of the project, and the dredge contractor will be required to use resource maps from the pre-construction survey to avoid resources. The biological monitoring section (Section K) expands on the details of the monitoring that will be required by the permit. Additionally, a Biological Monitoring Plan has been approved by the Department and will be attached to the permit. The Plan, which will be a binding part of the permit, specifies monitoring procedures for SAV. Should unpermitted project-related impacts to SAV resources occur, mitigation will be required.

Mangrove and Marsh Vegetation

Mangroves and marsh vegetation are present along the fringe of the lagoon shoreline. In the northern portion of project, salt marsh habitat is present on the landward side of Sand Dollar Island. Mangroves line much of the eastern portion of the waterway from R-128 to R-131.5. Current trends of beach migration shoreward suggest that without intervention the beach may fuse to the inland shoreline in this area. The proposed project will widen the waterway adjacent to mangroves, thereby maintaining hydrological connection to this habitat. South of R-131.5, mangroves are present on both sides of the waterway. Mature mangroves line a large portion of the Tigertail Lagoon. The mangrove community includes red (*Rhizophora mangle*), white (*Laguncularia racemose*), and black (*Avicennia germinans*) mangroves. Monitoring will be required to ensure the proposed project does not impact mangrove or marsh habitats.

Beach

The beach, swash zone and surf zone of the project area is comprised of soft sandy bottom. The sandy substrate in the subtidal, intertidal and supratidal portions of the beach is an important habitat for invertebrates living on (epibenthos) or within (infauna) the sediment. This invertebrate community can include crabs, polychaetes, gastropods, and bivalves. The infaunal organisms are important food items for shorebirds and fish.

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The infauna inhabiting the beach placement area will be buried by the project. This burial will temporarily eliminate the infaunal population within the placement area, but recolonization from adjacent beaches is expected to begin immediately. Studies have shown that beach, swash zone and surf zone populations of infauna will rebound to pre-nourishment levels within a year of construction if the fill material is similar to the existing beach sand.

Sand Dunes

Dune vegetation in the proposed beach restoration area has sparse coverage which is suitable for nesting shorebirds. To maintain the low cover of vegetation, monitoring will be required to estimate percent cover of dune vegetation for adaptive management purposes. If the percent cover exceeds 10% total cover or if sandbur (*Cenchrus* spp.) recruitment is noted, then the regulatory agencies will be notified immediately for adaptive management.

C. Protected Fish & Wildlife

Pursuant to the Environmental Resource Permit Applicant's Handbook, Volume I, 10.2.7(b), in evaluating whether the proposed activity will adversely impact the ecological value of uplands to aquatic or wetland dependent listed species that nest in upland, such as marine turtle and shorebirds, and to maintain consistency with the authority of the Florida Fish and Wildlife Conservation Commission (FWC) under Florida's Coastal Zone Management Program, the Department considered comments received from the FWC and the U.S. Fish and Wildlife Service (FWS). Pursuant to the Environmental Resource Permit Applicant's Handbook, Volume I, 10.3.1.5, *mitigation can include the implementation of management plans, or other measures*, such as the Terms and Conditions and the Reasonable and Prudent Measures from the FWS Biological Opinion, as well as the recommended conditions from the FWC. These requirements will be incorporated into the permit.

Turtles

The beaches in Collier County provide potential nesting habitat for threatened loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) marine turtles. Placement of sand on a marine turtle nesting beach can impact nesting females, their nests, and hatchlings due to modifications of the profile and incubation substrate relative to the native beach. Nesting females may respond to these changes by an increase in non-nesting emergences (false crawls), a decrease in the number of nests deposited, or a shift in nest site selection across the profile. Altering the incubation substrate can also affect the female's decision to nest, as well as the hatch and emergence success for the nest.

In accordance with 161.041(5), F.S., no construction that could result in take of threatened and endangered marine turtles and shorebirds shall begin until the required federal incidental take authorizations are issued in accordance with the federal Endangered Species Act. In the event that additional or different requirements from the permit conditions are specified in

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the U.S. Fish and Wildlife Service (FWS) Incidental Take Authorization and Biological Opinion, additional marine turtle protection conditions shall be incorporated into the permit through a modification. Additionally, no relocation of marine turtle nests shall occur unless specifically authorized by the FWC in a permit issued pursuant to Florida Statute 379.2431(1) and Rule 68E-1, F.A.C. Therefore, in accordance with Florida Statute 379.2431 (1), FWC has included marine turtle protection conditions in the draft permit.

Birds

The project is located within the Big Marco Pass Critical Wildlife Area (CWA). First established in 1988, this CWA provides protection for nesting and foraging seabirds, shorebirds, and wading birds. The CWA consists of the emergent island, mudflats, and lagoon along the northwestern edge of Marco Island. This CWA has historically supported large colonies of nesting black skimmers and least terns, along with solitary nesting pairs of Wilson's plovers and killdeer. Nesting occurs along the northern half of the CWA, comprised of a mosaic of open sandy beach and sparse dune vegetation. Resident and migratory seabirds, shorebirds, and wading birds rely on the area for roosting and foraging along the shoreline and flats of the lagoon. Portions of the CWA are posted closed each year under state rule (68A-19.005 F.A.C.) to prevent disturbance to nesting and foraging birds. Entry into any CWA posted areas would require additional authorizations from the FWC.

Portions of the proposed project site are located within an area that supports beach-nesting birds, including black skimmers and least terns which are both state listed as Threatened. The excavation of 130,000 cubic yards of sediment for construction of the sand trap at the north point of Sand Dollar Island is likely to result in take via significant habitat modification for these species. Construction in proximity to breeding sites can also cause take by interfering with nesting success, including mortality of eggs, chicks, and fledglings due to disturbance from heavy equipment and construction. The project area is also within the FWC-designated [Reddish Egret Core Foraging Area](#). Loss or degradation of suitable foraging habitat within Core Foraging Areas can result in take via significant habitat modification because suitable foraging habitat is limited for this species. The proposed flow channel on the back side of Sand Dollar Island has the potential to result in take via significant habitat modification for this species. The FWC has determined that the proposed project will result in Take of State-Listed Threatened species as defined by Chapter 68A-27.001, F.A.C, and that an FWC Incidental Take Permit (ITP), as defined by Chapter 68A-27.007, F.A.C., will be required.

The Florida Fish and Wildlife Commission has additional authority under Chapter 379, F.S. to protect upland habitat used by shorebirds.

Manatees

Florida manatees (*Trichechus manatus latirostris*) inhabits the waters of Collier County year round. Use of this area is documented by aerial, telemetry, and mortality data. Manatee

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aerial survey data indicate that manatee distribution in this county is widespread, and they exhibit an array of activities in the county including traveling, resting, feeding, and cavorting (mating).

Tigertail Lagoon /Sand Dollar Island system is located in an area designated as Important Manatee Area (IMAs) per the *Effect Determination Key for the Manatee in Florida*. As a protective measure, the draft permit will require that the FWC Standard Manatee Conditions for In-Water Work be followed during construction in all project areas. Additionally, since the proposed project falls within an IMA, the draft permit will require dedicated protected species observers and limit nighttime clamshell dredging.

D. Other Criteria

Public Health, Safety or Welfare

The proposed restoration project will help to improve water flow within the lagoon, reduce the potential for overwashing and subsequent shoaling within the lagoon, which may reduce the potential for adverse impacts to public health, safety or welfare to occur, should the lagoon become stagnant.

Property of Others

The proposed project is expected to maintain the functionality of the existing mangrove shoreline and related habitats adjacent to the overwashed areas; thus naturally reducing the potential future vulnerability of upland property. The proposed project is not expected to adversely affect the property of others.,

Additionally, it is not expected to unreasonably infringe upon the traditional, common law riparian rights, of upland property owners adjacent to sovereignty submerged lands.

Navigation

The project is expected to remediate harmful shoaling within the lagoon. Other than any possible restrictions to navigational access on a temporary basis during dredging, the proposed project is not expected to adversely affect navigation.

Recreation

The restoration and maintenance of the TLSDI will allow continued use by the public for observation of wildlife, picnicking, sunbathing, swimming, surfing, recreational fishing, and related activities.

Historical and Archaeological Resources

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In their letter dated April 21, 2021 (DHR Project File No. 2021-2317), the Florida Division of Historical Resources (DHR) presented the findings of their Due Diligence review for the proposed project. They determined that the proposed activities are unlikely to affect historic properties. Nevertheless, General Condition 10, included in the draft permit, establishes a protocol in the case of unexpected fortuitous find.

E. Water Quality

The proposed project includes the dredging of the flow channel and the sand trap, with placement of sediment on the gulf-fronting Sand Dollar Island. Additionally, sediment may be dredged from the previously authorized Hideaway Nearshore and Offshore Borrow Areas.

The proposed flow channel dredge area lies within Class III waters of the Tigertail Lagoon. Mangroves and SAV are located in the vicinity of the proposed flow channel dredge area. All dredging will avoid direct impacts to mangroves and SAV in the area. Additionally, because of the presence of SAV resources adjacent to the dredge/excavation area, the mixing zone within this dredge area will be truncated at the edge of the adjacent resources. Therefore, during dredging of the flow channel, turbidity will be monitored at the edge of the 150-meter mixing zone or nearest downdrift SAV edge to ensure compliance with the State Water quality standard (29 NTUs above background).

The majority of the proposed sand trap is located within an accretional area of the Rookery Bay Aquatic Preserve and is subject to the antidegradation requirements of Rule 62-4.242, F.A.C. This Rule 62-4.242(2)(b)2., F.A.C., allows for some deviations from background to account for natural fluctuations in turbidity levels at the site. By measuring the natural background variability of turbidity over one tidal cycle, adjacent projects have demonstrated that background turbidity levels naturally fluctuate by at least 3 Nephelometric Turbidity Units (NTUs) in the vicinity of the proposed project in the Rookery Bay Aquatic Preserve. Therefore, during dredging of the sand trap, turbidity will be monitored at the edge of the 150-meter mixing zone to ensure compliance with the antidegradation threshold (3 NTUs above background).

The proposed Sand Dollar Island Restoration Area lies along Class III waters of the Gulf of Mexico. The proposed sediment disposal work will be accomplished in a manner that minimizes the potential for elevated turbidity. Pursuant to Rule 62-4.244(5)(d), F.A.C., best management practices will be implemented to minimize the magnitude and duration of turbidity to the maximum extent practicable. Therefore, during sediment disposal, turbidity will be monitored at the edge of the mixing zone polygon (150 meters offshore by 1000 meters down current) to ensure compliance with the State Water quality standard (29 NTUs above background).

Pursuant to Rule 62-4.242 (2)(a)2.b. F.A.C., the Applicant has requested an extension of the thirty-day time period in which elevated turbidity levels may occur within a mixing zone that

is located in an OFW. Since the Applicant has demonstrated that the work cannot be completed in 30 days, and that no adverse impacts are expected to occur as a result of the requested time extension, the Department intends to grant the extension

The proposed project may result in improved water quality within the Tigertail Lagoon system. Water quality monitoring of additional parameters (other than turbidity) will be required to document changes to water quality within the influence of the project. The protocols for the additional water quality assessment will include data collected at quarterly discrete sampling stations and also by continuous sampling using a datasonde.

The draft permit will outline the water quality monitoring protocol required to provide reasonable assurance that project activities do not violate the State's water quality standard, the antidegradation allowance nor adversely impact the adjacent SAV or mangrove communities.

F. Sand Quality

Pursuant to Rule 62B-41.007(2)(j), F.A.C., to protect the environmental functions of Florida's beaches only beach compatible fill shall be placed on the beach or in any associated dune system. Beach compatible fill is material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system.

A sediment quality assurance /quality control (QA/QC) plan that provides reasonable assurance that the sediment from the borrow areas will meet the standard in Rule 62B-41.007(2)(j), F.A.C., was submitted with the application. The sediment compliance values are included in the Sediment QA/QC Plan (dated September 21, 2021), which will be incorporated into the final permit by reference. The Department requires compliance with this plan.

G. Coastal Engineering

Pursuant to Rule 62B-41.005(3), F.A.C., the Department has received adequate engineering data concerning the existing coastal system and the design features that is sufficient for an evaluation of the proposed activities. The department received the Engineering Management Plan, prepared by Humiston & Moore Engineers, dated April 5, 2021. Pursuant to Rule 62B-41.007(2), F.A.C., the proposed project is designed in accordance with generally accepted coastal engineering standards and practice.

In accordance with the definition provided in Rule 62B-36.002(4), F.A.C., or the provisions of sub-section 161.101(3), F.S., the project area is not designated as critically eroded beach. The activity as proposed is not beach restoration defined as the placement of sand on an

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eroded beach for the purposes of restoring it as a recreational beach and providing storm protection for upland properties, pursuant to subsection 161.021(4), F.S.

The proposed addition of the gulf-front segment of Sand Dollar Island as a placement site for the dredged material from the inlet-fronting segment of Sand Dollar Island is not expected to have an adverse impact to the Big Marco – Capri Pass Complex, and is consistent with Section 161.142(1), F.S.

The project monitoring data has not indicated adverse effects from dredging the permitted nearshore borrow area. The proposed northeastward extension of the borrow area will be leeward of the ebb shoals of the Big Marco and Capri Pass Complex where it will be aligned with the tidal currents and further sheltered from ocean waves. Consequently, the borrow area extension is not expected to result in adverse effects to inlet tidal hydraulics or increase erosion of Hideaway Beach.

The project monitoring demonstrates migration and accretion of beach-compatible sand into the proposed borrow area extension; hence, detailed information concerning the material to be excavated and analysis of the compatibility of the material with the respective placement sites is not required from the applicant. Furthermore, a sediment quality assurance/quality control plan is not required as a specific condition for approval of the permit.

Pursuant to Rule 62B-41.005(2), F.A.C., coastal construction authorized by the Department shall have a net positive benefit to the coastal system resulting from the project's effects, as demonstrated by the Applicant, taking into account the considerations and requirements of Section 161.041, F.S. The removal of sand from the borrow area will likely reduce sediment transport toward the Collier Creek entrance, and thereby, minimize shoaling and maintenance of the navigation channel. The transfer of sand from the borrow area to the gulf-front segment of Sand Dollar will supply sand to the Marco Island as waves and tides transport the sand to the downdrift beaches.

H. Impact Minimization

The Applicant has provided reasonable assurance that measures will be taken to minimize any potential adverse impacts to the maximum extent practicable. During the permit application process, the proposed sand trap acreage was reduced to reduce the potential impact on shorebird nesting habitat. Additionally, the project design and the size of the mixing zone were adjusted to avoid impacts to SAV. During sediment disposal, the Applicant will employ best management practices (BMPs) to minimize turbidity and will monitor in accordance with FWC recommendations and the sediment QA/QC plan to minimize potential impacts to marine turtles and shorebirds. A turbidity allowance of 3 NTUs above a corresponding background sample will be used for work within the OFW pursuant to the antidegradation rule. The dredge/excavation sediment has a similar grain size as the existing beach and is expected to maintain the general

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environmental character and functionality of the material on the native beach. This will be conducive for marine turtle nesting and promote rapid recovery of the infauna community.

No impacts to SAV, hardbottom, or mangroves / marsh will be authorized by the permit; therefore, avoidance and minimization measures will be required to be implemented during construction to minimize potential unauthorized impacts to natural resources. These measures include restricting the mixing zone to the edge of the nearest SAV bed, prohibiting anchoring or storage of equipment within SAV beds, establishing a no-work zone (10-meter buffer) around SAV resources, and requiring all work near (within 30-meters of) resources to be reported. SAV monitoring will also be required to document any unauthorized project-related impacts, if they occur. Pre-construction mapping and monitoring will be required to provide the contractor with maps of benthic resources, and the Applicant will be required to instruct their contractor to use these maps to avoid resources. Additionally, a portion of the proposed dredged channel (i.e., the distribution channel) will be hand dug to reduce the potential for impacts to adjacent SAV resources. The narrow distribution channel will not be excavated until the Permittee has provided updated drawings and current SAV survey information to the Department for approval through a permit modification.

I. Sovereign Submerged Lands

A letter of consent will be required for the dredging of the flow channel and the distribution channel as well as the disposal of sediment on sovereign submerged lands. A public easement will be required for the creation and subsequent dredging of the sand trap. An erosion control line will not be established at the sediment disposal site on the gulf-front segment of Sand Dollar Island area because the area is not contiguous with upland property, the uplands areas of Sand Dollar Island are State owned and the site is not on a critically eroded beach.

Pursuant to Rule 18-21.004(3)(a), F.A.C., the proposed project is not expected to unreasonably infringe upon the traditional, common law riparian rights, as defined in Section 253.141, F.S., of upland property owners adjacent to sovereignty submerged lands; because the activity will not impede access to, or view of the water. Additionally, pursuant to Rule 18-21.003(53), F.A.C., the proposed project would be in the public interest because the activity provides demonstrable environmental, social, and economic benefits, by maintaining a navigable waterway, and providing more storm protection, without causing any significant environmental harm.

Pursuant to Rule 18-21.004(3)(b), F.A.C., satisfactory evidence of sufficient upland interest is not required for activities on sovereignty submerged lands that are not riparian to uplands, or when a governmental entity conducts restoration and enhancement activities, provided that such activities do not unreasonably infringe on riparian rights. In this case, the sand placement site on the gulf-front segment of Sand Dollar Island area is not contiguous with upland property and the uplands areas of Sand Dollar Island are State owned, so sufficient upland interest is not required

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The proposed project is expected to maintain this environmental and recreational resource so that the public may continue to enjoy traditional uses of the TLSDI system, including but not limited to, boating, fishing and swimming. Removing the overwashed sand from the lagoon will restore natural habitat and return the biological and recreational value of the area. The disposal of sediment on the berm will also restore and maintain nesting habitat for marine turtles and shorebirds. The proposed project is not expected to impact SAV resources or generate a significant amount of turbidity, so it will not interfere with the propagation of fish and wildlife. Additionally, the Florida Department of State's Division of Historical Resources evaluated this project and determined that no cultural resources will be affected by this project. After considering all the factors listed above, the Department has determined that the project is expected to meet the Sovereign Submerged Lands criteria in Rule 18-21.004(2), F.A.C.

J. Mitigation

The draft permit does not authorize direct or secondary impacts to benthic resources. Mitigation will only be required if adverse, unauthorized, project-related impacts occur.

The proposed project may result in improved water quality and subsequent expansion of SAV in Tigertail Lagoon. Water quality monitoring will be required to document changes to water quality. If improvements in water quality and/or SAV expansion are demonstrated, the Department may evaluate these improvements for lift (pursuant to Rule 62-345, Uniform Mitigation Assessment Method) as potential compensatory mitigation if needed.

The FWC has determined that the proposed project will result in Take of State-Listed Threatened species as defined by Chapter 68A-27.001, F.A.C., and that an FWC Incidental Take Permit (ITP), as defined by Chapter 68A-27.007, F.A.C., will be required. The ITP will include mitigation measure to offset take incurred by the proposed project.

K. Monitoring

Biological monitoring will be required to document any potential unauthorized impacts to natural resources. The Applicant will be required to provide the construction contractor with an accurate map of benthic resources in the project area prior to commencement of construction so that impacts can be minimized to the greatest extent practicable. Monitoring will include the in-situ delineation of the edge of benthic resources, as well as qualitative and quantitative measurements of SAV and mangrove resources pre and post construction. Dune vegetation monitoring will be conducted to inform adaptive management plans. If the coverage of dune vegetation exceeds 10% total cover or sandburs are documented, adaptive management will be employed which may include the removal of dune vegetation.

Water quality monitoring for turbidity will be conducted during construction to ensure that water quality standards are being met. The turbidity monitoring contractor will be

independent of both the design contractor and the construction contractor. Additional water quality monitoring will be conducted to document potential water quality improvements in Tigertail Lagoon due to increased flushing that may result from the proposed project.

All biological monitoring will be conducted according to the Department-approved Biological Monitoring Plan (Approved December 20, 2021), which details the monitoring parameters, methods, schedules, and reporting requirements for the project. The approved Biological Monitoring Plan will be a binding part of the permit. See the approved Biological Monitoring Plan and the draft permit for specific information on monitoring of SAV, mangroves and marsh, dune vegetation, and water quality (except turbidity), and deliverable submittal requirements.

Sediment quality at the nourished beach will be monitored in accordance with the approved sediment QA/QC plan.

Per FWC guidelines, the draft permit will include pre, during, and post construction monitoring for marine turtles and shorebirds.

No physical monitoring plan is being required on the proposed project. However, as built bathymetric surveys of the dredge locations will be required post construction to verify avoidance of SAV impacts.

L. Public Interest

Regulatory

As discussed in the sections above, the Department has considered the effects of this project according to the public interest criteria that are specified in Section 373.414(1), F.S., and the Environmental Resource Permit Applicant's Handbook, Volume I, 10.2.3. The following is brief summary of that evaluation for each of the public interest criteria:

- The activity will have a positive effect on public safety and public welfare, and is not expected adversely affect the property of others;
- The activity is not anticipated to adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
- The activity is intended to offset harmful shoaling and erosion;
- The activity is not anticipated to adversely affect the fishing or recreational values or marine productivity in the vicinity of the activity;
- The proposed construction activity will be of a temporary nature;
- The activity will not adversely affect significant historical and archaeological resources under the provisions of s. 267.061; and

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- The current condition and relative value of functions being performed by areas affected by the proposed activity in whole will generally be improved by the project.

After weighing the effects of the project for each of these criteria, and based on reasonable assurance provided by the Applicant, the Department has determined that the proposed activity is clearly in the public interest.

Proprietary

The proposed project will reduce the potential for overwash, relieve the shoaling within the lagoon, thereby improving flushing within the lagoon maintaining the aquatic and upland habitats within the TLSDI system. Therefore, pursuant to Section 161.088, F.S., the proprietary authorization for this project is in the public interest. The project will not adversely affect fish and wildlife habitat or other natural or cultural resources and will not interfere with traditional recreational uses such as fishing, boating, and swimming. Pursuant to Rule 18-21.003(54), F.A.C., the demonstrable environmental, social, and economic benefits which would accrue to the public at large as a result of this activity would exceed all demonstrable environmental, social, and economic costs of the proposed action. Therefore, pursuant to Rule 18-21.004(1)(a), F.A.C., the Department has determined that this project is in the public interest.

M. Specific Regulatory Basis for Issuance

The Applicant has provided affirmative reasonable assurance that the construction of the activity will comply with the provisions of Part IV of Chapter 373, F.S., and the rules adopted thereunder. The Department has considered the direct, secondary and cumulative impacts of the project, as well as the general and specific conditions to the attached draft permit, in making this determination. Specifically, construction of the activity will not result in violations of water quality standards, nor will the construction activities degrade ambient water quality in Outstanding Florida Waters pursuant to Rule 62-4.242, F.A.C., other than turbidity within the approved mixing zone, pursuant to Section 373.414(1), F.S., and set forth in Chapters 62-4 and 62-302, F.A.C.. The Applicant also has demonstrated that the construction of the activity is clearly in the public interest, pursuant to Paragraph 373.414(1), F.S.

Also, pursuant to Rule 62-4.242 (2)(a)2.b., F.A.C., the Applicant requested an extension of the thirty-day time period for water quality degradation in an OFW. Although the rule limits water quality degradation within an OFW to a period of thirty days, it also offers the Department some discretion. The Department may allow an extension of time, in which construction-caused degradation may occur within a defined mixing zone, if the Applicant can demonstrate that the extension is unavoidable, and that suitable management practices and technology will be employed to minimize any degradation. Given the nature and scale of this beach restoration project, it would be impossible to complete the work within thirty days. Also, the Applicant proposes to use best management practices for controlling turbidity at the dredge site. Therefore,

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pursuant to Rule 62-4.242(2)(a)2.b. F.A.C., the Department intends to allow for a temporary elevation of turbidity, within the mixing zone, for a period not to exceed 120 days.

The Applicant has also provided adequate engineering data to evaluate the design features of the project and any potential effects to the coastal system. Pursuant to Chapter 161, F.S., the Department finds that the proposed activities:

- will not result in any significant adverse impacts to the sandy beaches of the state;
- are not expected to adversely impact nesting marine turtles, their hatchlings or their habitat;
- will not interfere, except during construction, with the use by the public of any area of the beach seaward of mean high water; and
- are appropriately designed in accordance with Rule 62B-41, F.A.C.

N. Specific Proprietary Basis for Issuance

The Applicant has met all applicable requirements for proprietary authorizations to use sovereign submerged lands. That includes the requirements of Article X, Section 11 of the Florida Constitution, Chapters 253 and 258, F.S., associated Rules 18-21 and 18-20, F.A.C., and the policies of the Board of Trustees. Therefore, the Applicant has provided reasonable assurance that the proposed activity would:

- be in the public interest;
- maintain essentially natural conditions;
- not cause adverse impacts to fish and wildlife resources or public recreation or navigation; and
- not interfere with the riparian rights of adjacent property owners.

IV. PUBLICATION OF NOTICE

The Department has determined that the proposed activity, because of its size, potential effect on the environment or the public, controversial nature, or location, is likely to have a heightened public concern or likelihood of request for administrative proceedings. Therefore, pursuant to Subsection 373.413(4), F.S. and section 5.5.5.3 of Applicant's Handbook, Volume I, you (the applicant) are required to publish at your own expense this Notice of Intent to Issue. The notice is required to be published one time, in the legal ad section in a newspaper or newspapers of general circulation in the areas affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to:

Florida Department of Environmental Protection
Office of Resilience and Coastal Protection

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Beaches Inlets and Ports Program
2600 Blair Stone Road, M.S. 3544
Tallahassee, Florida 32399
Email: BIPP@dep.state.fl.us

The proof of publication shall be provided to the above address within 30 days of issuance of intended agency action, or within 21 days of the date of publication, whichever occurs sooner. Failure to publish the notice and provide proof of publication within the allotted time shall be grounds for denial of the permit, letter of consent and easement to use sovereign submerged lands.

V. NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rules 28-106.201 and 28-106.301, F.A.C., a petition for an administrative hearing must contain the following information:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;
- (c) A statement of when and how the petitioner received notice of the agency decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

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- (f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant and persons entitled to written notice under Section 120.60(3), F.S., must be filed within **14** days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within **14** days of publication of the notice or within **14** days of receipt of the written notice, whichever occurs first. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us, before the deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the

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Department within 20 days from the date when this order is filed with the Clerk of the Department.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Florida Rules of Appellate Procedure 9.110 and 9.190 with the Clerk of the Department in the Office of General Counsel (Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000) and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice must be filed within 30 days from the date this action is filed with the Clerk of the Department.

EXECUTION AND CLERKING:

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



Gregory W. Garis.
Program Administrator
Beaches, Inlets and Ports Program
Office of Resilience and Coastal Protection

Attachment(s):

1. Approved Permit Drawings (Sheets 1-11)
2. Approved Biological Monitoring Plan (Approved Dec. 2021)

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this document and all attachments were sent on the filing date below to the following listed persons:

cc: Greg Garis, DEP, ORCP, Gregory.Garis@dep.state.fl.us
Robert Brantly, DEP ORCP, Robert.Brantly@dep.state.fl.us
Natalie Geyer, DEP, ORCP, Natalie.Geyer@FloridaDEP.gov
Michelle Pasawicz, FWC, Michelle.Pasawicz@MyFWC.com
Ricardo Zambrano, FWC Ricardo.Zambrano@MyFWC.com
Keith Lakkonnen, DEP, keith.laakkonen@dep.state.fl.us
Jeff Carter, DEP, Jeffrey.A.Carter@dep.state.fl.us

Consolidated Notice of Intent to Issue

File No. 0401778-001-JC

Tigertail Lagoon / Sand Dollar Island Ecosystem Restoration Project

Page 20 of 20

Megan Mills, DEP S District Megan.Mills@dep.state.fl.us

MarineTurtle@myfwc.com

ImperiledSpecies@MyFWC.com

FDEP.OTHER@usace.army.mil

JCPCCompliance@dep.state.fl.us

BIPP@dep.state.fl.us

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Sandra H Rogers
Clerk

12/21/2021
Date

XI. Attachment C. Project Change Order and Contractor Proposal

EXHIBIT E
CHANGE ORDER NO. 2
2022 Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project
Contract #2022-022

TO:

Ahtna Marine & Construction Co.
2125 E. Atlantic Blvd Suite A
Pompano Beach, FL 33062

FROM:

City of Marco Island
50 Bald Eagle Drive
Marco Island, FL 34145

Project: 2022 Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project

CITY COUNCIL CHANGE ORDER APPROVAL

(a) Agenda Item: TBD

Change Order No. 2

Construction Agreement Date:

September 19, 2022

Bid No. 2022-022

Change Order Description: This Change Order **No. 2** serves to:

Provide additional sand volume necessary to mitigate Hurricane Ian damage – 60,000 cubic yards at \$10.84/CY, total - \$650,400.00 (see Item 3 in the Exhibit "A").

Original Agreement Amount: \$3,306,187.50

Sum of Previous Change Orders Amount: \$158,342.50

This Change Order No. 2 Amount [Increase]: **\$650,400.00**

Revised Agreement Amount: **\$4,114,930.00**

Original Contract Time in calendar days: 150 (to final completion)

Adjusted number of calendar days due to previous change orders: 180

This Change Order adjusted time is: n/a

REVISED CONTRACT TIME IN CALENDAR DAYS: 180

Original Notice to Proceed Date: 10-10-2022

Substantial Completion date based on original contract time: 03-01-2022

Revised Substantial Completion Date Due To Change Order(s): **04-01-2022**

Your acceptance of this Change Order shall constitute a modification to our Agreement and will be performed subject to all the same terms and conditions as contained in said Agreement indicated above, as fully as if the same were repeated in this acceptance. The time and monetary adjustment to this Agreement shall constitute a full and final settlement of any and all claims arising out of or related to changes set forth herein including claims for schedule impacts, material/labor costs and delay costs.

CONSENT OF SURETY TO CHANGE ORDER. The Surety agrees that this change order is not a cardinal change and if the Change Order includes an increase in the Contract amount, then the penal amount of the payment and performance bond issued for this Contract is increased by the dollar amount of this Change Order.

Project: 2022 Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Project
Change Order No. #2

Submitted by: _____ Date: _____
Justin Martin, P.E. Public Works Director
City of Marco Island

Accepted by: _____ Date: _____
Jennifer Bistyga, Project Manager
Ahtna Marine & Construction Co.

Authorized by: _____ Date: _____
Guillermo Polanco, Finance Director
City of Marco Island

Authorized by: _____ Date: _____
Michael A. McNees, City Manager
City of Marco Island



12/15/2022

Lina Upham
 Purchasing and Risk Manager
 Deputy City Clerk
 City of Marco Island
 50 Bald Eagle Dr.
 Marco Island, FL 34145

Subject: 2022 Tigertail Lagoon/Sand Dollar Island Ecosystem Restoration Change Order 1

Dear Ms. Upham,

Please find attached Change Order No. 1 for Ahtna Marine & Construction Co., to conduct additional offshore dredging as requested by the City of Marco Island.

The pricing for the offshore dredging is broken down into a base volume as well as an additional volume for sand placement.

Offshore Borrow Area Dredging

Item	Item Description	Estimated Quantity	Unit	Unit Cost	Extended Cost
1	Mobilization to offshore borrow area	1	Job	Lump Sum	\$ 44,780
2	Base Volume	25,000	CY	10.84	\$ 271,000
3	Additional Volume	60,000	CY	10.84	\$ 650,400
Subtotal for Mobilization and base volume					\$ 315,780
Total Cost Items 1 through 3					\$ 966,180

Notes:

- Minimum quantity of 25,000 cubic yards to be dredged
- Mobilization to include additional pipe, sinking of the pipe support boat, booster and dredge relocation to the offshore borrow area.
- Pricing is based on 10,500 LF of dredge discharge pipe from the offshore borrow area to the beach fill area

The following items have been excluded from this change order

- Dredging of compacted materials, rock, or other hard materials
- Dredging of trash, debris, or like materials
- Engineering or Permitting
- Removal of hazardous materials
- Any unknown or unforeseen obstructions that may interfere with dredging operations
- No Fuel credits or assumptions

This pricing is valid for 45 days unless agreed upon by both parties to extend. This change order is based upon availability of AMCC equipment and personnel at the time of intent to commence the work.

Thank you for your time and consideration of Change Order No. 1

Please do not hesitate to contact me with any questions.



Jennifer Bistyga

Project Manager

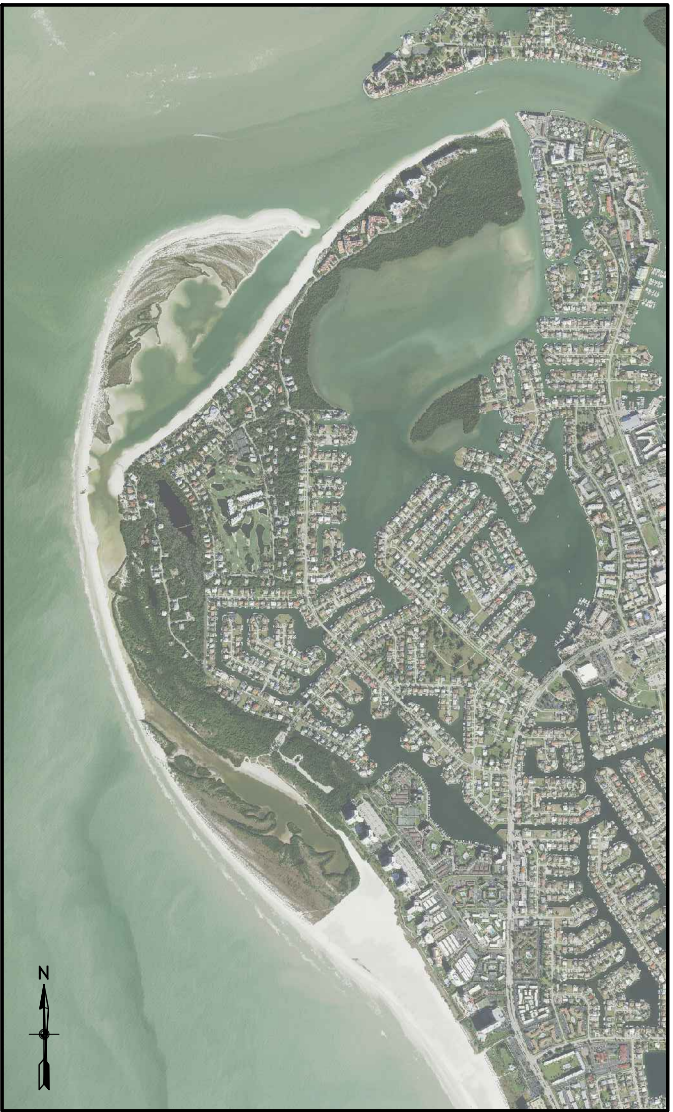
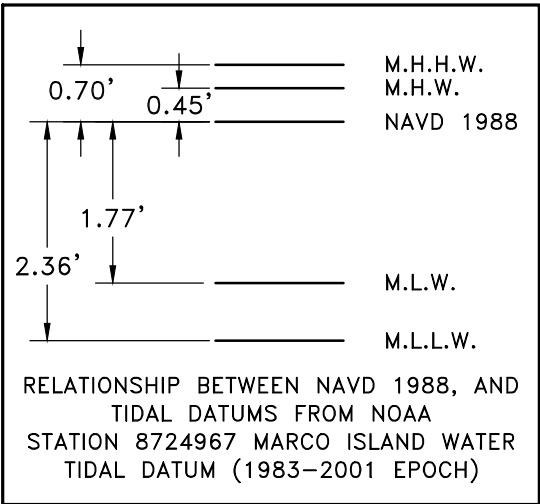
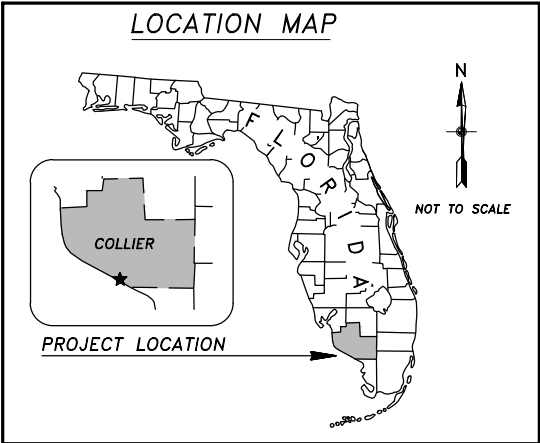
Ahtna Marine & Construction Co.

XII. Attachment D. Project permit plans and listing of permits

- DEP Permit Number: 0401778-001-JC
- USACE Permit Number: SAJ-2007-04224
- FWC Permit Number: LSNR-22-00119

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

0401778-001-JC



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

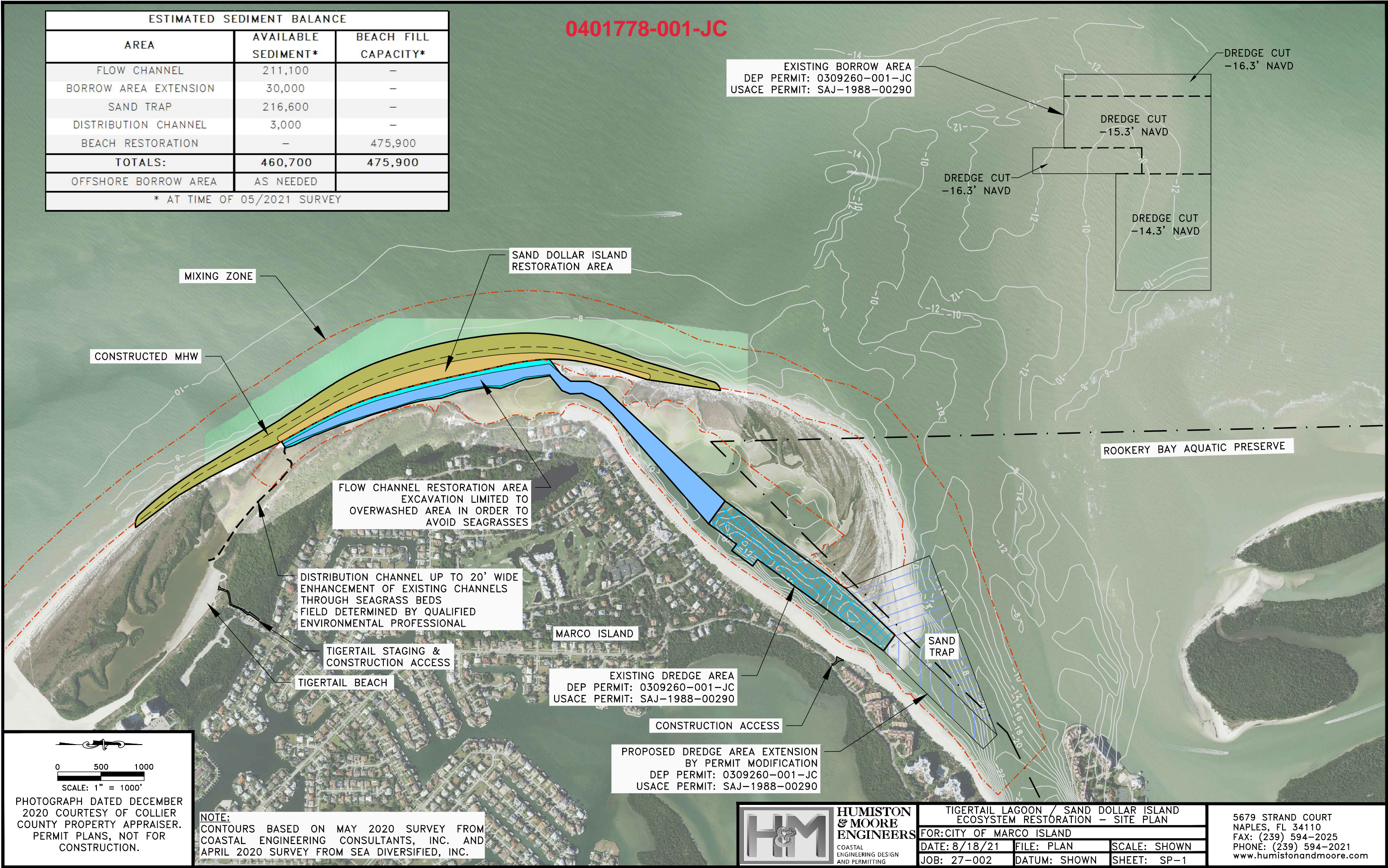
NOTES:

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.

HUMISTON & MOORE ENGINEERS <small>COASTAL ENGINEERING DESIGN AND PERMITTING</small>	TIGERTAIL LAGOON / SAND DOLLAR ISLAND ECOSYSTEM RESTORATION - COVER			5679 STRAND COURT NAPLES, FL 34110 FAX: 239 594 2025 PHONE: 239 594 2021
	FOR: CITY OF MARCO ISLAND			
	DATE: 8/18/21	FILE: PLAN	SCALE: N/A	
	JOB: 27-002	DATUM: SHOWN	SHEET: COVER	

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		

0401778-001-JC



0401778-001-JC

SAND DOLLAR ISLAND
RESTORATION AREA

CONSTRUCTED MHW

2015 CWA BOUNDARY
(ESTABLISHMENT ORDER CWA 15-05)

ROOKERY BAY AQUATIC PRESERVE

FLOW CHANNEL RESTORATION AREA
EXCAVATION LIMITED TO
OVERWASHED AREA IN ORDER
TO AVOID SEAGRASSES

DISTRIBUTION CHANNEL

TIGERTAIL STAGING &
CONSTRUCTION ACCESS

EXISTING AREA OF
AUTHORIZED DREDGING

EROSION CONTROL LINE

CONSTRUCTION ACCESS

PROPOSED DREDGE AREA EXTENSION
BY PERMIT MODIFICATION

SAND
TRAP

EROSION CONTROL LINE

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	596680.15	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



0 400 800

SCALE: 1" = 800'

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

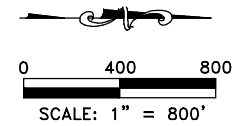
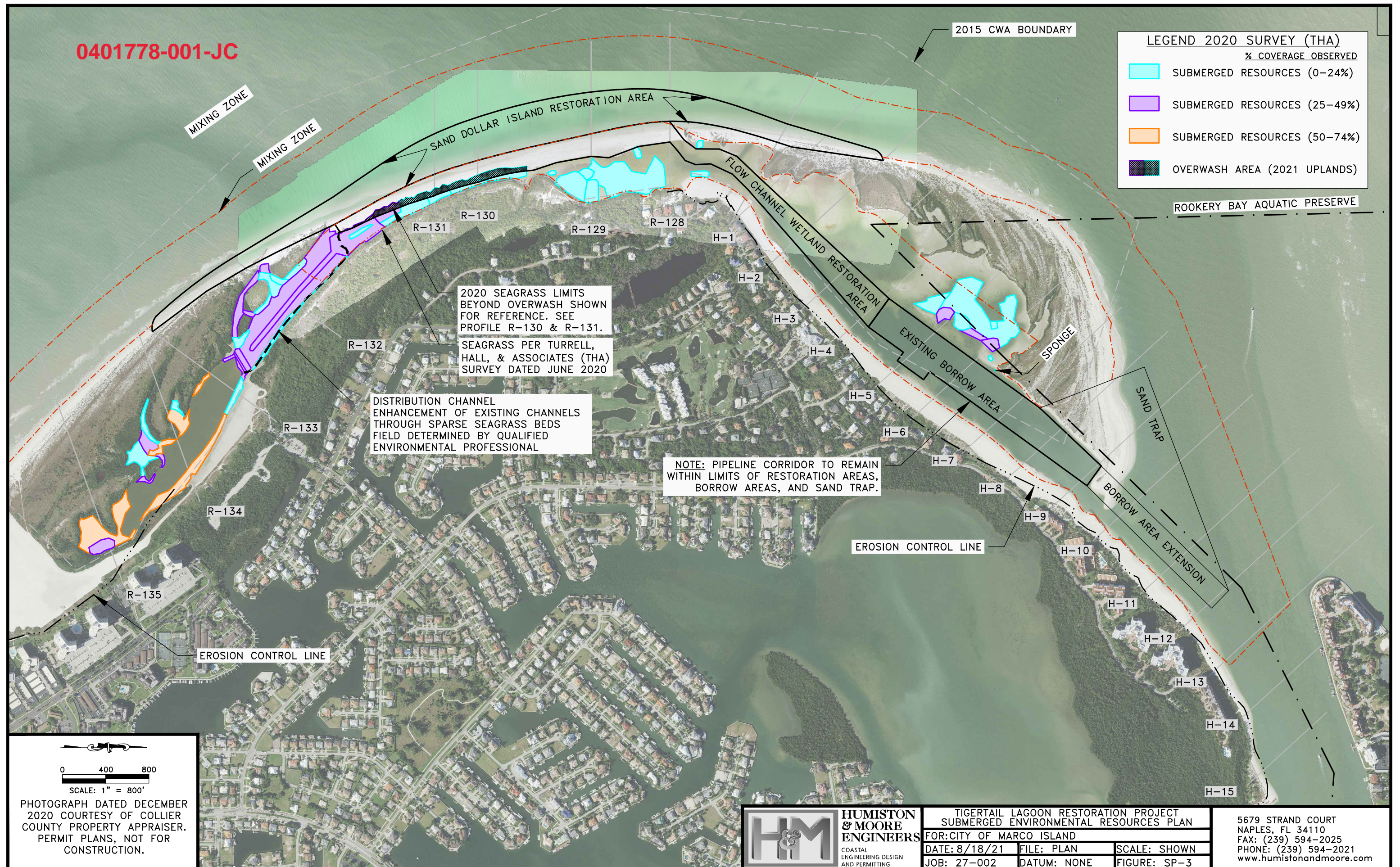


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TIGERTAIL LAGOON / SAND DOLLAR ISLAND
ECOSYSTEM RESTORATION - BEACH SITE PLAN
FOR: CITY OF MARCO ISLAND
DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
JOB: 27-002 DATUM: SHOWN SHEET: SP-2

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

0401778-001-JC



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

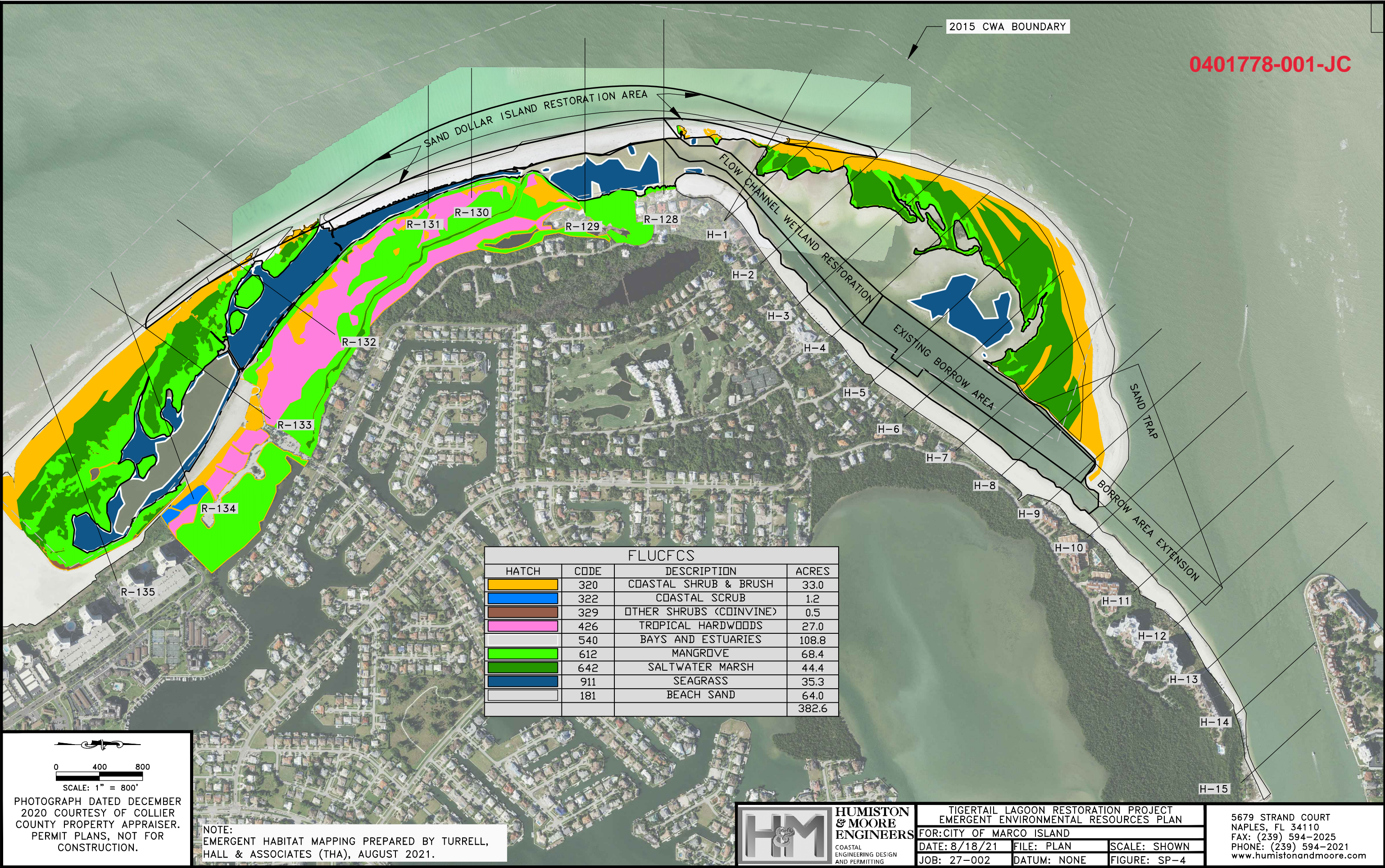


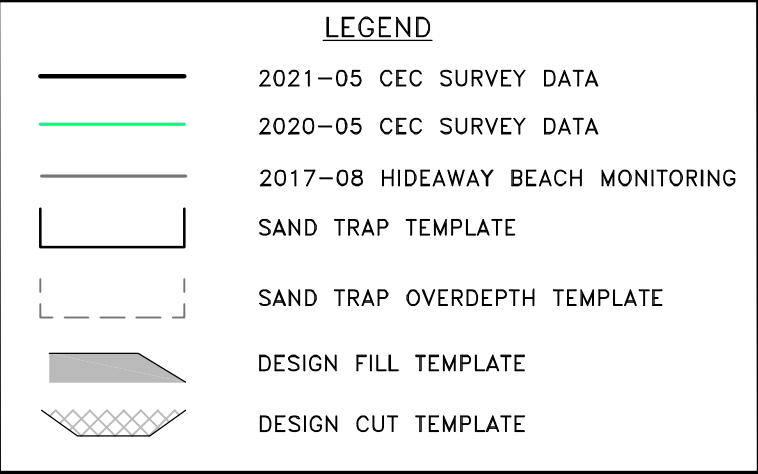
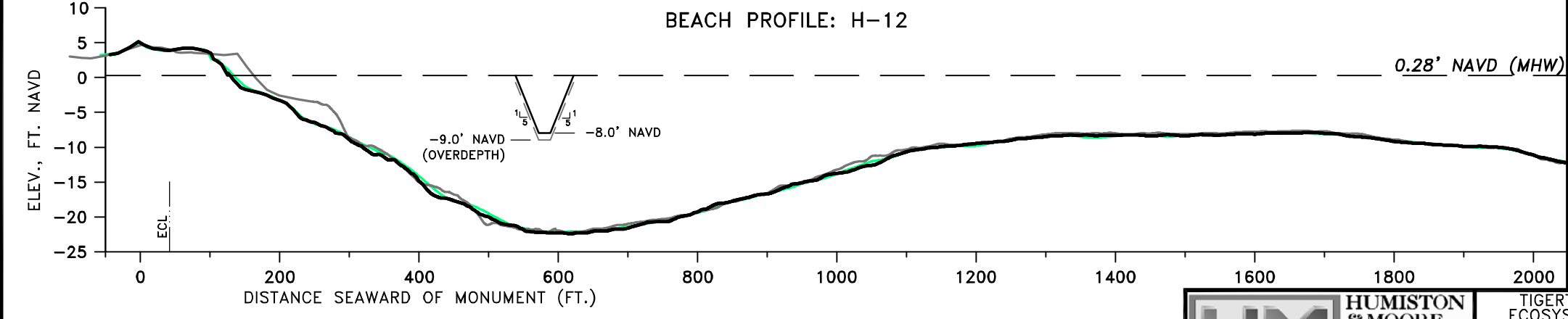
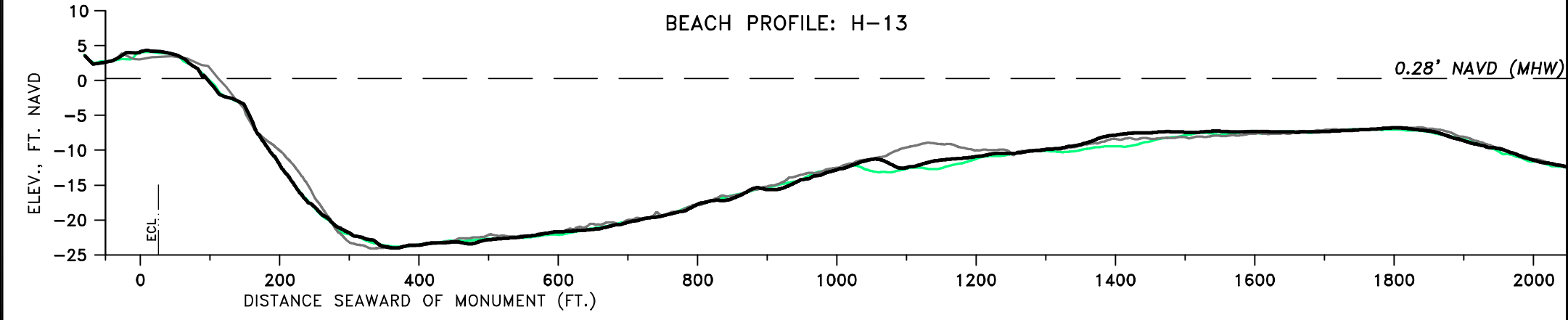
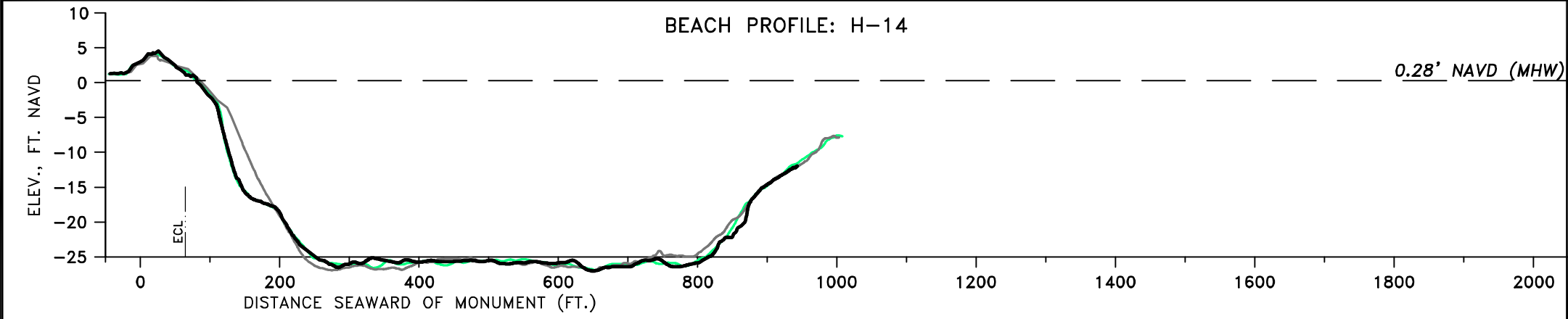
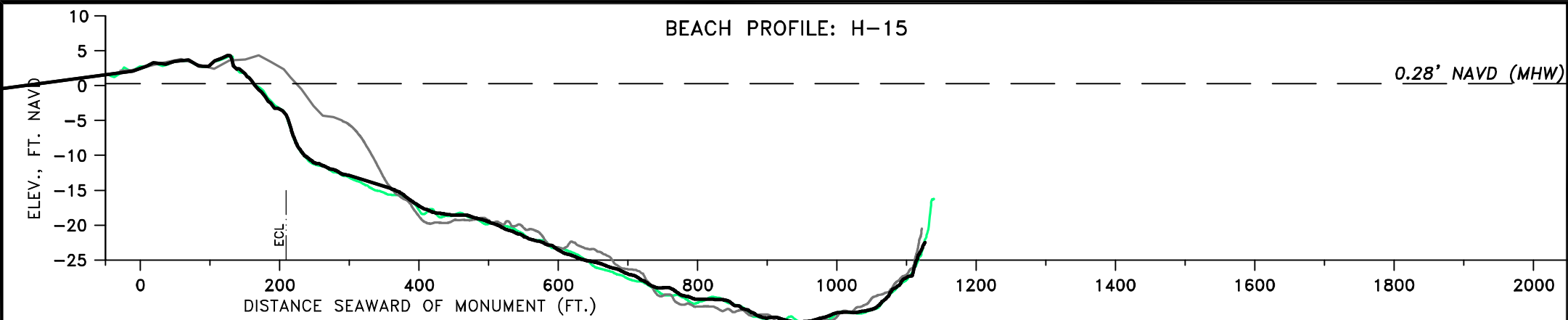
TIGERTAIL LAGOON RESTORATION PROJECT
SUBMERGED ENVIRONMENTAL RESOURCES PLAN
FOR: CITY OF MARCO ISLAND

DATE: 8/18/21	FILE: PLAN	SCALE: SHOWN
JOB: 27-002	DATUM: NONE	FIGURE: SP-3

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
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0401778-001-JC





- 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

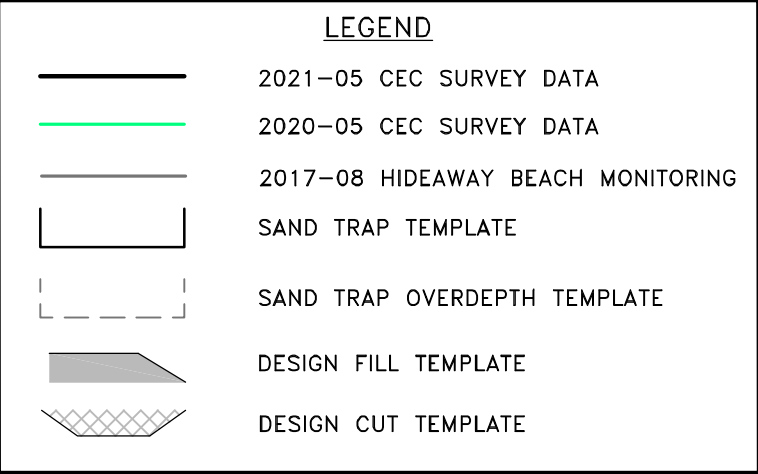
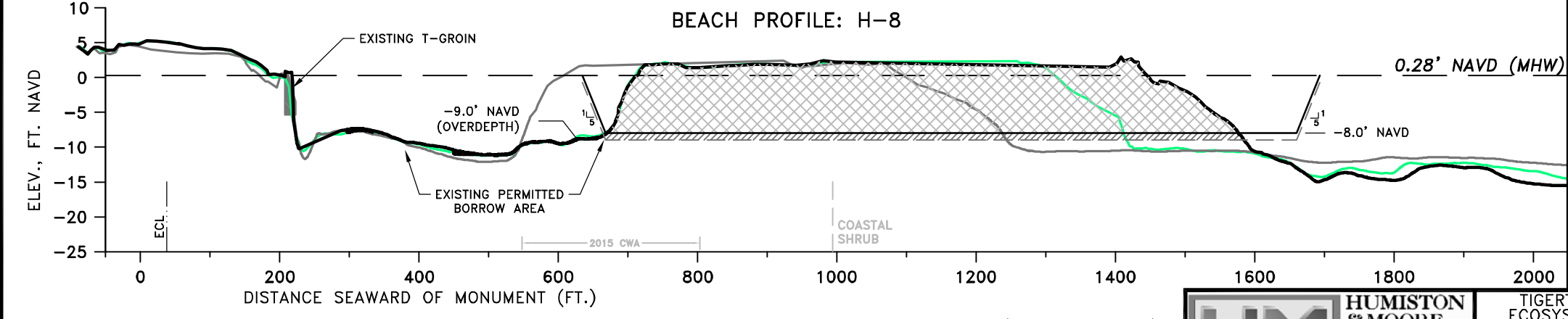
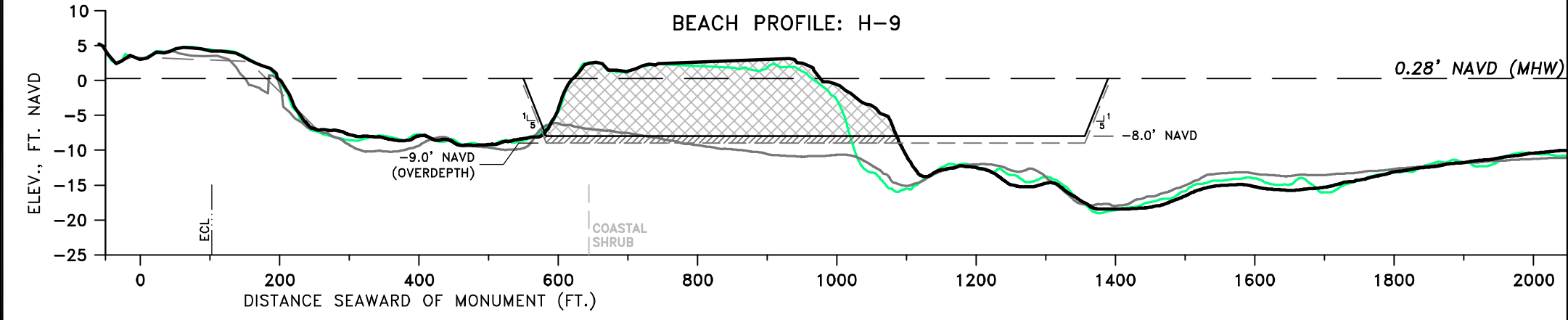
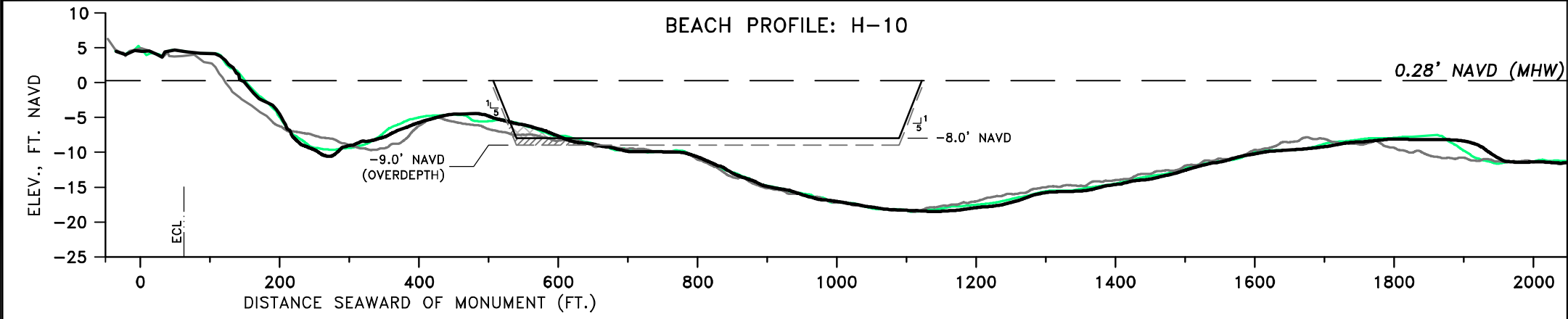
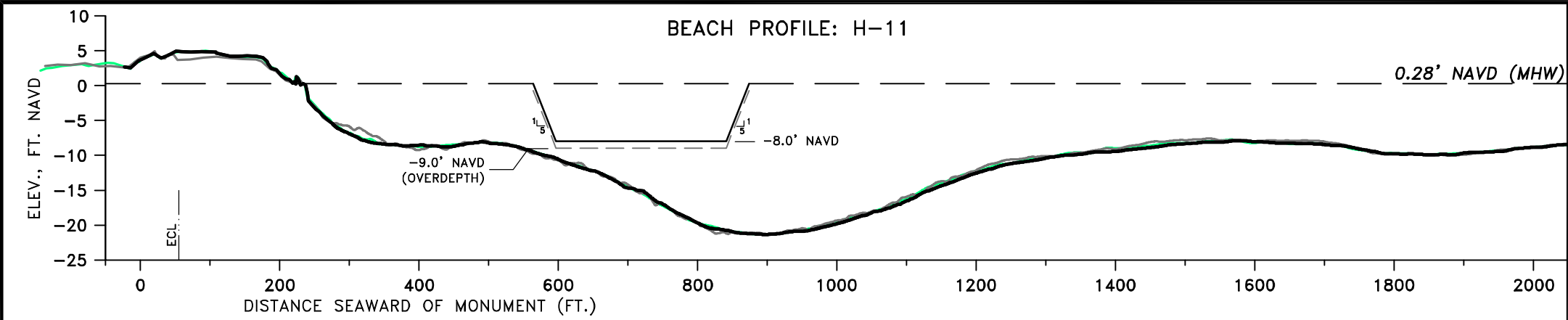
0401778-001-JC



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AND PERMITTING

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

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com



- NOTES:
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 - 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

0401778-001-JC

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

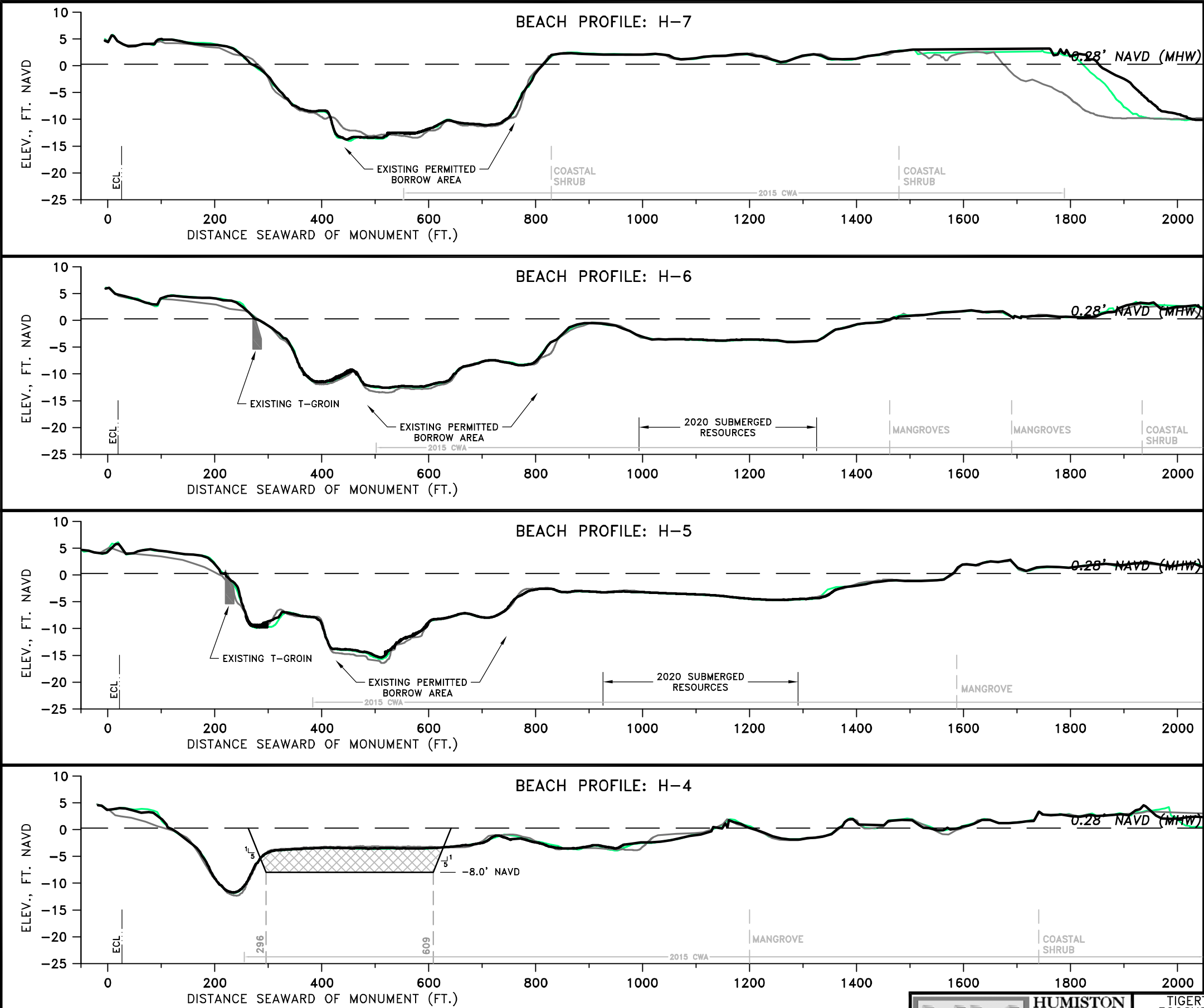
NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H



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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

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
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LEGEND

2021-05 CEC SURVEY DATA

2020-05 CEC SURVEY DATA

- 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

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

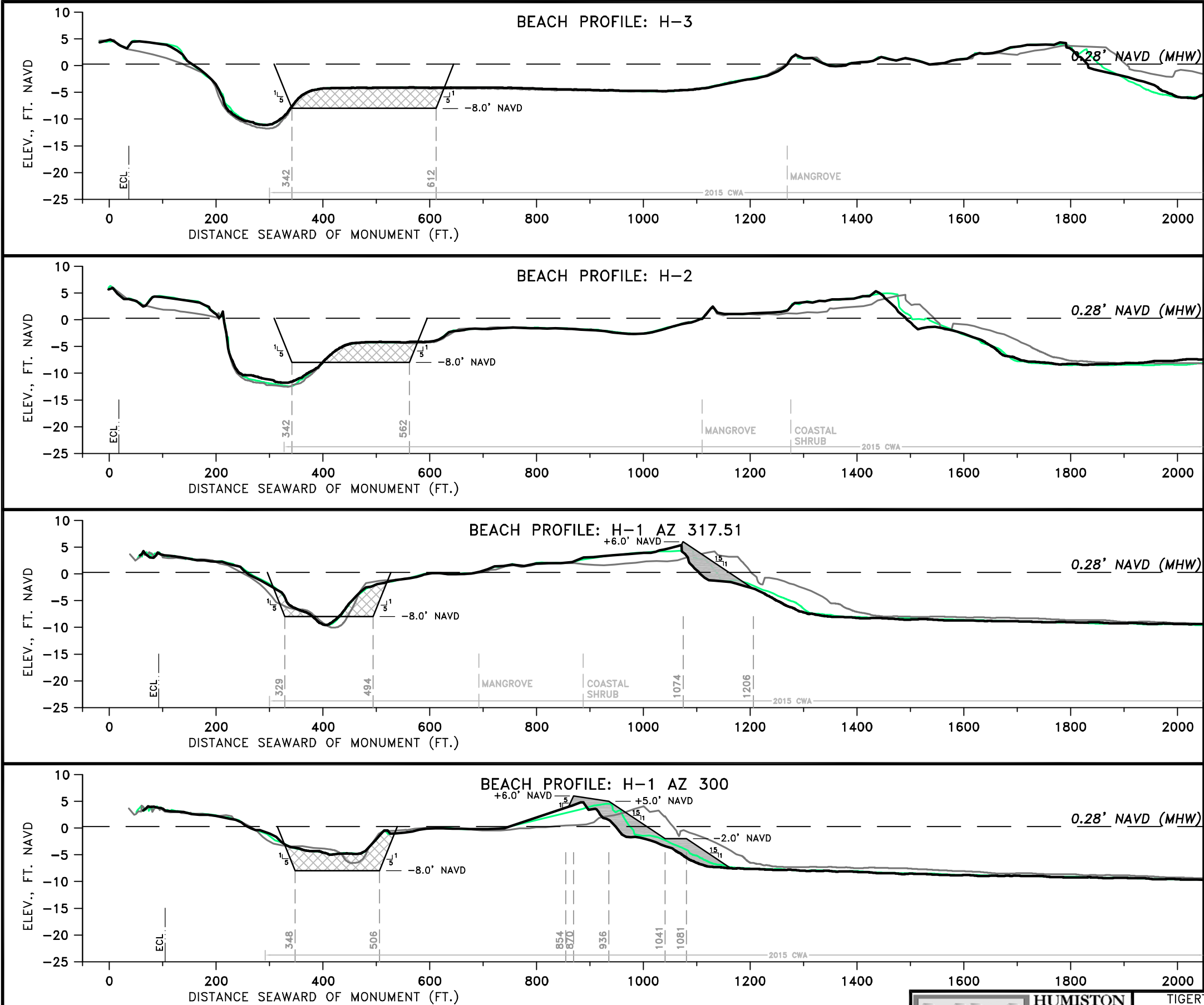
NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H



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AND PERMITTING

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-3

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
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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

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

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

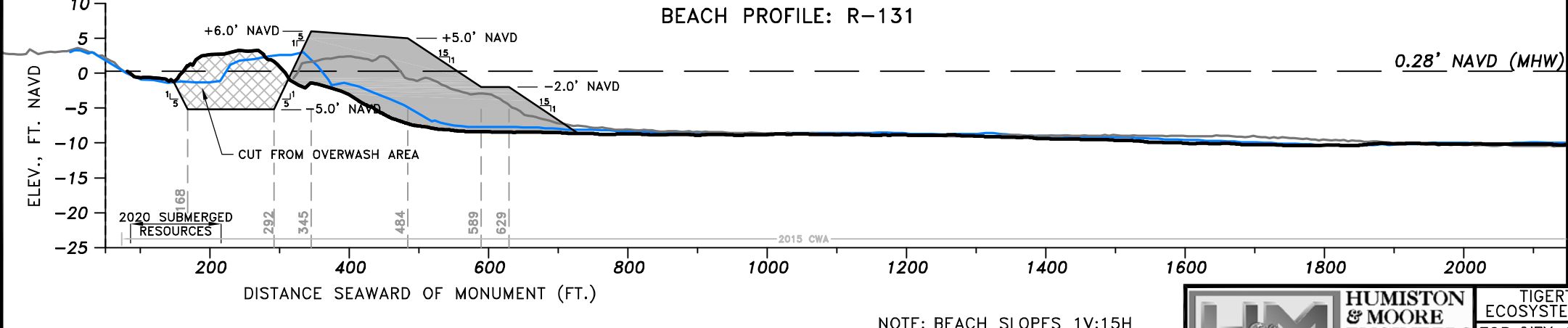
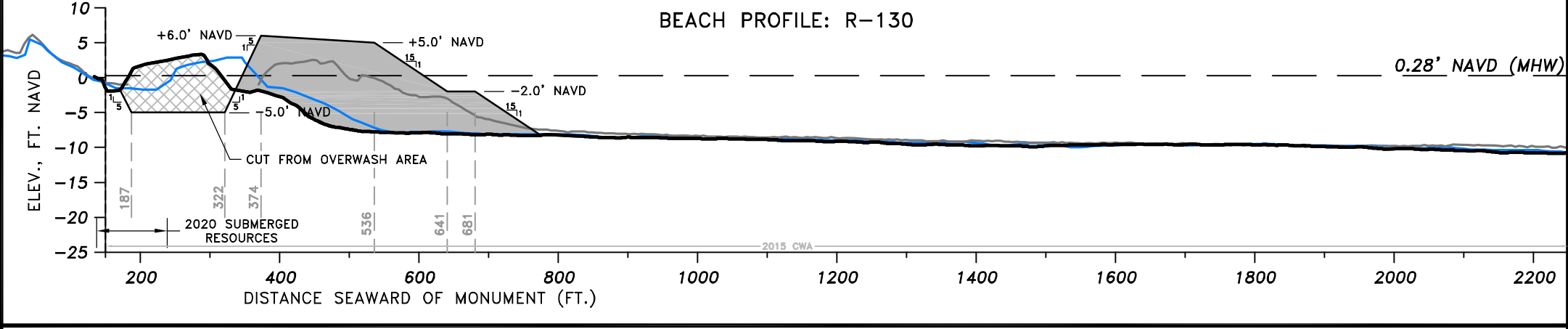
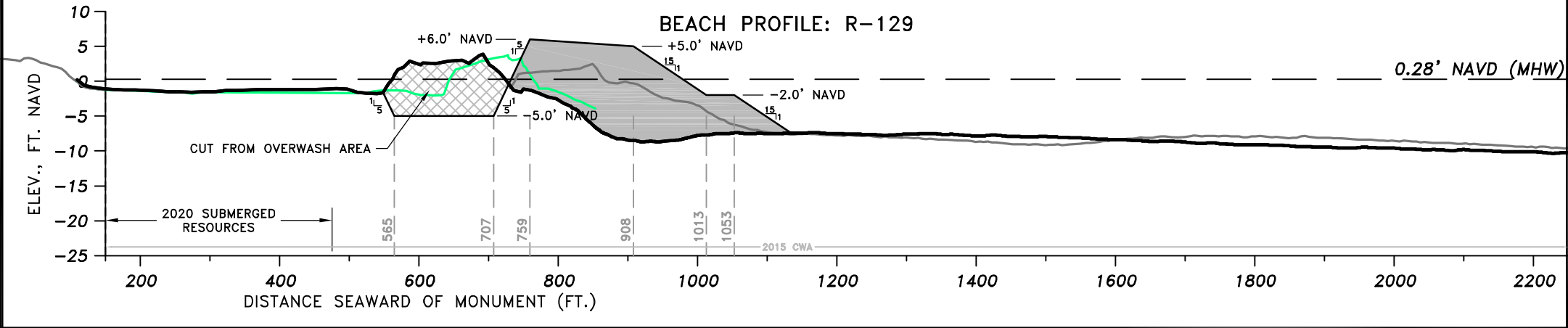
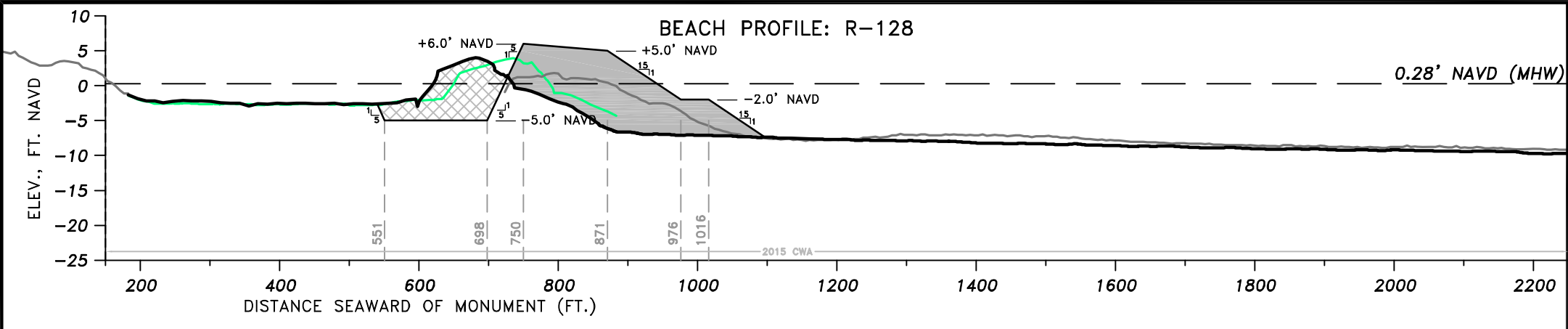
BERM FILL			
MONUMENT	EFFECTIVE DISTANCE (FT)	FILL DENSITY (CY/FT)	FILL VOLUME (CY)*
H-1 @ 317	481	11.7	5,600
H-1 @ 300	698	27.3	19,100
R-128	889	88.3	78,500
R-129	888	117.3	104,100
R-130	725	127.9	92,700
R-131	1253	112.7	141,100
R-132	1562	22.3	34,800
TOTALS:			475,900
* AT TIME OF 05/2021 SURVEY			



HUMISTON & MOORE ENGINEERS
COASTAL ENGINEERING DESIGN AND PERMITTING

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-4

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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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			
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			

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

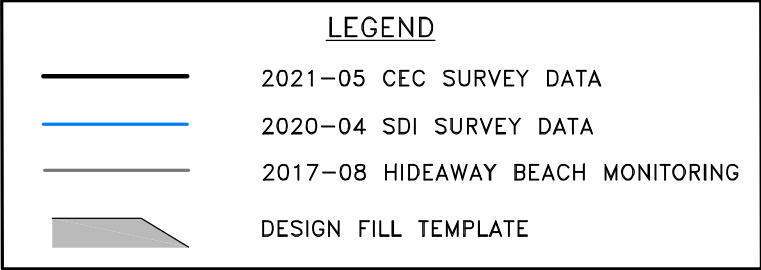
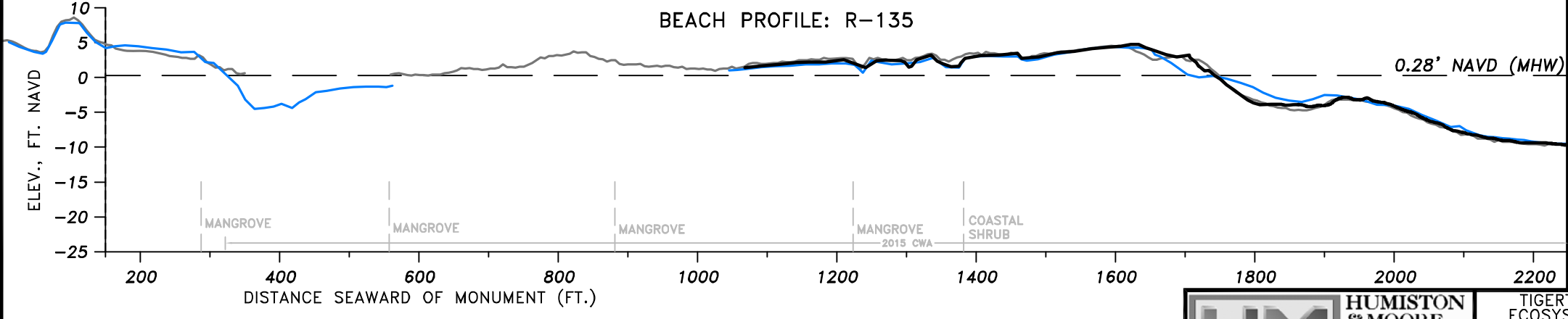
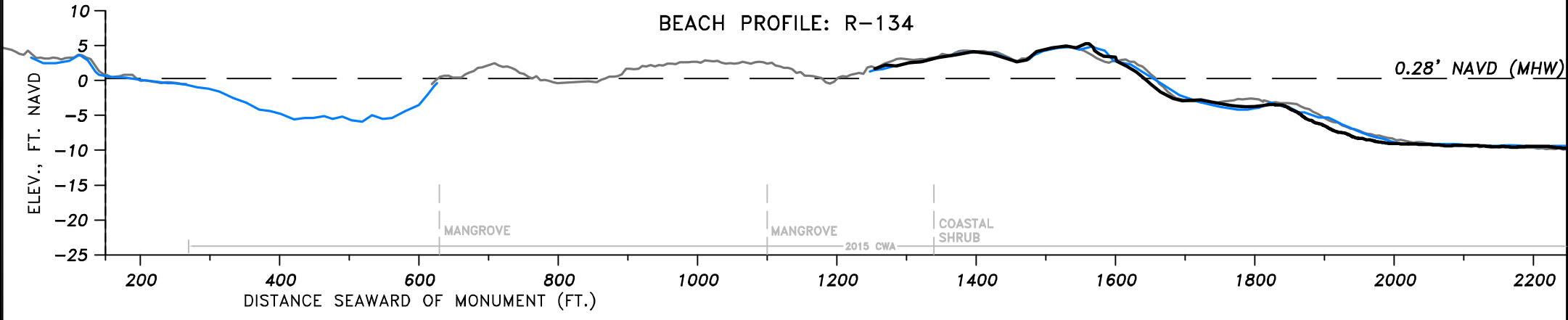
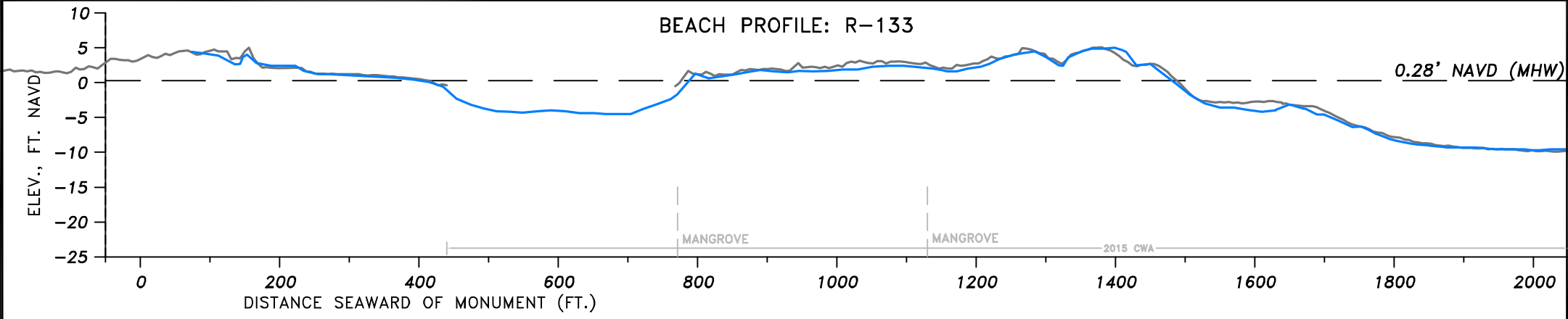
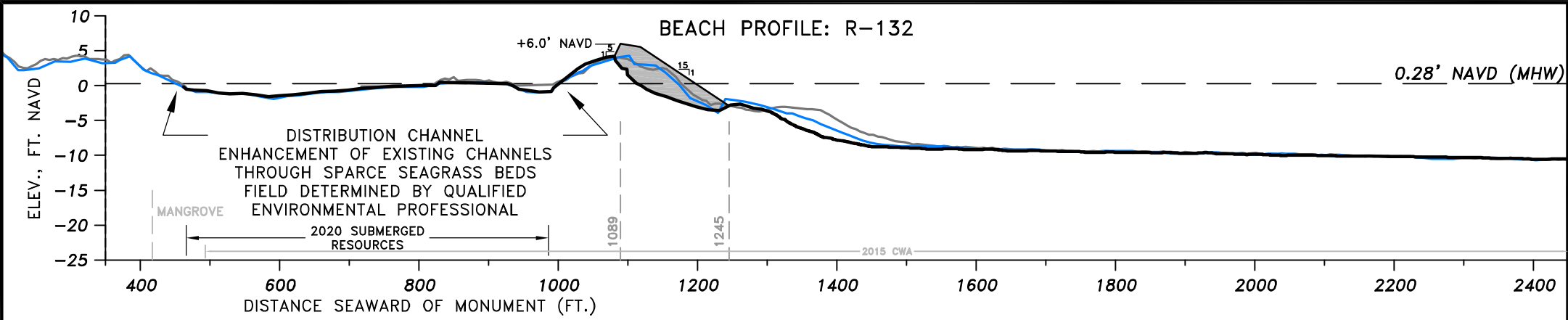
NOTE: BEACH SLOPES 1V:15H
CHANNEL SLOPES 1V:5H



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TIGERTAIL LAGOON / SAND DOLLAR ISLAND
ECOSYSTEM RESTORATION – SPIT CROSS SECTIONS
FOR: CITY OF MARCO ISLAND
DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
JOB: 27-002 DATUM: NONE FIGURE: XS-5

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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- 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.

0401778-001-JC



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ECOSYSTEM RESTORATION - CROSS SECTIONS
FOR: CITY OF MARCO ISLAND
DATE: 8/18/21 FILE: PLAN SCALE: SHOWN
JOB: 27-002 DATUM: NONE FIGURE: XS-6

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