MAJOR LAND AND WATER
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
IN RESPONSE TO QUESTIONS FROM PUBLIC AND CZM
FOR THE
LATITUDE 18 VESSUP BAY MARINA
ST. THOMAS, U.S. VIRGIN ISLANDS

SUBMITTED

DEPARTMENT OF PLANNING AND NATURAL RESOURCES
DIVISION OF COASTAL ZONE MANAGEMENT
AND
U.S. ARMY CORPS OF ENGINEERS

PREPARED FOR

JACK ROCK B-A C LLC

PREPARED BY

APPLIED TECHNOLOGY & MANAGEMENT, INC
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DECEMBER 2022

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1.0 NAME AND ADDRESS OF APPLICANT

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3.00 ABSTRACT

Jack Rock B-AC LLC purchased property within Estate Nazareth with the intention of developing a World Class Marina with an upland mixed use commercial development. Consolidated parcel 9B-A comprises a total of 5.556 acres. The entire area is zoned W-1-Waterfront Pleasure. The Proposed Development is permitted by the Virgin Islands Code as a matter of right. The project site contains a peninsula that forms the southern entrance to Red Hook Bay. That peninsula is a rocky abutment that extends to the National Park Service property on the East side and abuts the Vessup Beach area to the south.

The project area was the site of the Latitude 18 Marina. This Marina has been through significant damages because of the Hurricanes over the past 25 years, specifically Hurricane Marilyn in 1995 and Hurricanes Irma and Maria in 2017. The original Marina was never fully restored after Hurricane Marilyn in 1995. The viability of the property as a Marina has continually diminished over time, finally closing from damages because of the 2017 Hurricanes. The Development Plan intends to take advantage of this unique promontory at the entrance to Red Hook Bay. The Development Plan is supported by environmental studies that is the basis for the location and development of upland, shoreline and overwater structures. The inclusion of a wave attenuator in the Marina Development Plan is intended to create calmer water under operational conditions. The Marina dock layout encompasses the area occupied by the previous Marina. The upland Development Plan includes areas reserved for natural drainage courses and preserved vegetation to address endangered species such the Tree Boa. A total of 32% of the lot areas are devoted to preservation, drainage areas, and landscaping.

The overall Development Plan includes a Managed Mooring Field that will have 70 buoys in Muller Bay. Pump Out Facilities and showers will be available for the clients that lease moorings in the Mooring Field. Managed mooring fields throughout the United States are amongst the means to have proper anchorage for moored vessels and proper environment management within the Bay through the on-land Pump Out Facilities. This mooring Field will be an example of sound environmental practices in the Bay.

5.0 SUMMARY OF PROPOSED ACTIVITY

Upland

The upland structures will include design motifs that are particularly Tropical and Historical Danish Architecture in nature. The building structures will have concrete foundations, steel super structure, and roofing. Structures will be enclosed by masonry exterior walls. All fenestrations will be impact resistant assemblies. There are two primary upland structures. They are:

• Restaurant & Marina Services Building
• Warehouse Buildings-Drystack Structure

Restaurant & Marina Services Building

The Restaurant & Marina Services Building is the cornerstone of the upland development. it is located on the Northeast Promontory of the site. This location forms the southern entry point to Red Hook Bay. The overall structure will be one and a half stories in height with a total square footage of approximately 10,000 SF.

The vehicular entry will approach from the southeast with a turnaround covered by Porte-Cochere. Visitors will proceed through the courtyard eventually to an external passageway to the promenade. Marina users will be able to proceed by foot to the Marina Waiting Pavilion to the west and from there to the docks. The first floor will contain Support Spaces, Kitchen, Restaurant & Retail. The northern and eastern sides of the Multi-Use Structure are surrounded by a promenade, lounge area and other areas that transition from the first level of the building down to the dock-level. The second floor of the structure will contain a sunset viewing deck with support space. The envelope on the second floor shall step back from the lower-level envelope.

The west side of the building will provide access to support facilities to mooring field users, including restrooms and showers.

Warehouse Building

The Warehouse Building will be 10,000 SF in size. It will be a single-story structure that will contain storge of materials and supplies related to the operation of the Marina and a drystack for vessels.

Site Layout

The concept behind the layout of this site is to take into consideration the environmental resources that constrict the location of buildings within the area. Entry to the project site will be at the northwestern corner of the property where the existing Latitude 18 access was located. From this entry point the access road splits to allow for visitor circulation to bend toward the south then eastward towards the Marina Services Building. On the northern side of the property there will be a service road that will only be utilized by Marina Operations. It will be located at that boundary and then toward the drop well of the marina portion of the property near the northwestern part of the promontory. The area between these two access roads will contain the Warehouse, onsite utility infrastructure, construction staging area, hurricane storage and daily boating trailers. The proposed parking areas will include public parking for visitors to use the retail establishments and beach area. In order to ensure that the view corridor from East Wind Condominiums is maintained the site plan has been revised.

The proposed Latitude 18 project will be comprised of a marina boat launch, marina building, drystack, and a restaurant. The supporting structures include a wastewater treatment plant, underground fuel tanks, potable water storage, and an electrical yard.

Boat Dry Storage and Service Yard Area

The marina boat dry storage and service yard will provide specialized facilities and equipment for boat storage and light technical services. The main facilities include:

- Drop well area – for launching and retrieval of boats using specialized equipment (e.g. marine forklifts)
- Maneuvering areas for equipment transferring boats
- Boat wash racks – stands for boat hull to be washed after retrieval from the water and before it is moved to the storage or service areas
- Boat drystack structure – for vertical storage of boats
- Boat workstations – yard area with utility connections, intended to secure boats for service work
- Workshop – shed for storage and equipment to support workstations

The facility will be designed so that yard spaces could potentially be interchangeable among the following 3 uses:

- boat drystack structures
- service workstations or
- surface dry storage (long term or for hurricane storage).

The handing equipment assumed for the basic design is marine forklifts, which are appropriate for motorboats up to about 45 feet. However, if sailboats, catamarans, or larger boats were to be served for surface dry storage, a travel lift will be required.

All runoff water from these areas will pass through an oil and water separator before being discharged into the retention basin.

1.1 Drop well, wash racks, circulation, and maneuvering

The drop well area can operate up to 2 forklifts or a travel lift. The forklifts and travel lift will be regularly serviced to ensure they do not leak oil. Forklifts will only be used during operating hours, which will be during the day, and the forklifts will have the required mufflers which will reduce sound. The basic design assumes the use of one main operational forklift for a design vessel of the following characteristics: motorboat, mono hull, up to 45 ft.

With the same footprint, equipment and installation modifications can allow the servicing of catamarans and surface dry storage of sailboats.

Adequate ground improvement or pavement will be provided in all circulation and yard areas, with appropriate stormwater and runoff management which will go through oil water separators before being discharged into the retention ponds.

1.2 Workstations for light services

The proposed service yard area includes 9 workstations. These are open air yard spaces with adequate ground improvements or pavement, supported by utilities and workshop shed.

1.3 Boat Drystack structure

The proposed drystack storage is comprised of open or semi-covered racks of 4 levels. The proposed plan includes 8 bays for drystack racks.

The most common industry practice is that each bay is designed to accommodate 2 or 3 boats. Typically, 2 wider (longer and heavier) boats at the ground and second level, or 3 narrower, lighter and shorter

boats at higher levels. Therefore, total capacity is inherently flexible. The proposed layout with 8 bays of 4 levels, has a capacity for 71 to 88 boats, depending on the arrangement of the racks in the bays.

Drystack Capacity (4 levels)	total capacity	<30ft	>30ft
Scenario 1	80	48	32
Scenario 2	88	72	16
Scenario 3	72	24	48

The stacks are designed to take boats over 30ft in length which will allow them to accommodate vessels larger than the existing drystacks on St. Thomas.

Marina

The proposed marine project is composed of docks and utilities, shoreline restoration and a managed mooring field.

The marina includes pile-supported fixed pier docks for the berthing of yachts. The marina will have 17 dedicated slips and 638 linear ft of alongside dockage, with a total capacity of 2,128 linear ft (approximately 26 vessels). The marina will provide permanent and transient berthing for a mix of vessels ranging from 60 to 200ft, with additional alongside berthing for smaller vessels.

The marina project lies in general location of a marina that was destroyed by previous storm events. The scope of work includes the removal of existing remaining structures, timber piles, sunken debris, and sunken vessels from the marina footprint.

The marina will have fuel service and fuel will provided by dispensers on the fuel dock, as well as in-slip fueling on the main docks slips.

The marina includes wave attenuation devices to provide comfort during operational conditions. A wave screen attached to the main fixed pier is proposed in areas that do not impede circulation flows. A floating wave attenuator is proposed to protect the marina slips facing Muller Bay and to reduce the need for wave screens.

Due to the elevation of the deck of the fixed piers, the docks which service smaller vessels, such as the fuel dock and smaller draft areas, will be provided with dock skirts to prevent small boats from going under the dock.

A new bulkhead will be built in front of the dilapidated existing bulkhead and rectifying the disturbed shoreline comprised of masonry irregular walls and a damaged pier structure, offering a stable water edge for access to the marina docks and marina operations. The seabed in the area adjacent to the new

bulkhead will be excavated to achieve – 12.5ft MSL elevation, to provide safe draft for the intended operation.

The area of dredging has increased and a total of 7200cubic yards will be dredged to a depth of 12ft from an area of approximately 5 acres (219,268sf). The dredge and dewatering plans are shown on page 12 of the ATM Latitude Marina Permit Set .

The precise depth of the marina when it was originally constructed is not known. However, the shoreline areas have been seen to shallow after the passage of hurricanes Irma and Maria which deposited sediment up against the bulkhead. Hurricane Marilyn and other passing tropical storms have probably also resulted in the deposition of nearshore sediments.

The material will be dredged with a clam shell or dragline from the shoreline or may be dredged from a small offshore barge. The material will be dewatered on shore in areas adjacent to the dredge area. The dredge spoil piles will be surrounded by silt fencing and haybales and a sandbag barrier. Dikes will be created from dredge material with a 1V:2H slope to create the dewatering area.

Sediment sampling of the site was conducted on April 1, 2008, at the surface and at a depth of 4 ft below the surface. Samples were analyzed for hydrocarbons, Primary Pollutant Metals and Mercury and Herbicides and Pesticides based on pasted uses within the area. No elevated readings were found. There has been no change of use within the area over the last 14 years. Samples were also just taken immediately across the channel at the Red Hook Barge Landing and no contaminants were found.

The total overwater area of all fixed piers, mooring dolphins, floating docks, gangways, and wave attenuator is 29,199 square ft.

The project includes 311.5 linear ft of bulkhead. The bulkhead will replace 140 linear ft of damaged bulkhead and 232 linear ft of disturbed shoreline comprising masonry irregular walls and a damaged pier structure.

The dock structures will have a total of 274 concrete 24” diameter piles and there will be 8 concrete mooring dolphins 24” in diameter and 4 wooden mooring piles 14-19” in diameterf. There will also be 16 concrete 24” pilings associated with the travel lift. The piling break down is in shown the following table and descriptions of the individual docks below.

	Piles (#)	Size (Typ. Diameter, in)	Type
Dock A-1	42	24	Concrete
Dock A-2	162	24	Concrete
Dock B	27	24	Concrete
Dock C	33	24	Concrete
DD-W	3	24	Concrete
DD-E	3	24	Concrete
Platform Access	4	24	Concrete
Travel Lift Piers	16	24	Concrete
Mooring Dolphins	8	24	Concrete
Mooring Piles - Slips	4	14-18	Timber
Total	302		

Dock A-1

Dock A-1 will be 399 ft long and 10 ft wide, oriented east-west parallel to the shoreline bulkhead and upland facilities. Dock A-1 provides access from land to Docks A-2 and Dock B. The concrete fixed dock has a total overwater area of 3,990 square ft. The east portion of Dock A-1 will provide 135 linear ft of alongside docking for small vessels. A floating dinghy dock (DD-E) will be adjacent to this dock. Indicative pile locations are shown on the project Drawings; 42 piles are anticipated for Dock A-1. The deck elevation of the pier will be +5.0 ft MSL.

Dock A-2

Dock A-2 provides berthing for approximately 17 vessels and has a total over-water surface area of 11,893 square ft. Eleven dedicated slips for vessels ranging in size from 70 ft to 130 ft and alongside berthing for large yachts on both sides of the T-head will be provided.

The shore perpendicular section of the concrete fixed dock will be 268 ft long by 15 ft wide. The shore parallel "T Head" of the dock will measure 335 ft long by 15 ft wide and will be able to accommodate large yachts. The 2 partial finger piers for the 130 ft slips will be 80 ft long and 10 ft wide with a 7 by 7 ft mooring dolphin. The 70-foot slips will have a full-length finger 7 ft wide. The deck elevation of the pier will be +5.0 ft MSL.

Indicative pile locations are shown on the project Drawings; 162 piles are anticipated for Dock A-2. Dock utilities such as water, electricity, fuel, pump-out, and Wi-Fi are proposed.
A wave screen attached to Dock A-2 is proposed in areas shown on the Drawings to attenuate locally generated waves and wakes and improve user comfort under normal operational conditions. The location and size of the wave screen was modeled to demonstrate that it will not adversely impact flushing of Vessup Bay.

Dock B

Dock B provides 4 dedicated slips and has a total over-water surface area of 1,468 square ft. Dock B features two double-loaded slips for 60 ft vessels, one 60 ft slip for catamarans, and an alongside slip dedicated for a 60 ft typical vessel.

The shore perpendicular section of the concrete fixed dock will be 108 ft long by 8 ft wide. The shore parallel "L head" of the dock will measure 61 ft long by 8 ft wide. The partial finger pier on Dock B will be 30 ft long by 6 ft wide, plus a mooring pile. The deck elevation of the pier will be +4.5 ft MSL. Indicative pile locations are shown on the project Drawings; 28 piles are anticipated for Dock B. Utilities such as water, electricity, and Wi-Fi are proposed for these slips.

Dock C

Dock C is designated for fuel and pump out service, as well as staging dock for the drop-well area. The concrete fixed dock has a total overwater surface area of 3,302 square ft.

The shore perpendicular section of the fixed dock will be 84 ft long by 12 ft wide, while the rest of the dock, angled 15° west from the shore perpendicular dock section, will be 190 ft long by 12 ft wide. The deck elevation of the pier will be +4.5 ft MSL.

Indicative pile locations are shown on the project Drawings; 32 piles are anticipated for Dock C. This dock will support fuel dispensers and a pump-out station. A floating dinghy dock (DD-W) will be adjacent to this dock.

Bulkhead

The proposed project includes the construction of a 311.5 linear ft of bulkhead, 281.5 linear ft along the waterfront and 30 linear ft as inland returns. The bulkhead will replace 140 linear ft of damaged bulkhead and 232 linear ft of disturbed shoreline comprising masonry irregular walls and a damaged pier structure. The bulkhead cap beam elevation will be +5.0 ft MSL on the western 90 linear ft of shoreline, to match the proposed fuel dock, drop well and access to Dock A-1. The bulkhead cap beam elevation will be +7.0 ft MSL on the eastern 191.5 linear ft. The bulkhead will be built immediately seaward of the structure that it is replacing, within 24 in from existing waterward face of the existing bulkhead and rectifying the alignment of the irregular masonry wall and other disturbed shoreline segments.

The area of dredging has increased and a total of 7200cubic yards will be dredged to a depth of 12ftfrom an area of approximately 5 acres (219,268sf). The dredge and dewatering plans are shown on page12 of the ATM Latitude Marina Permit Set.

The precise depth of the marina when it was originally constructed is not known. However, the shoreline areas have been seen to shallow after the passage of hurricanes Irma and Maria which deposited sediment up against the bulkhead. Hurricane Marilyn and other passing tropical storms have probably also resulted in the deposition of nearshore sediments.

The material will be dredged with a clam shell or dragline from the shoreline or may be dredged from a small offshore barge. The material will be dewatered on shore in areas adjacent to the dredge area. The dredge spoil piles will be surrounded by silt fencing and haybales and a sandbag barrier. Dikes will be created from dredge material with a 1V:2H slope to create the dewatering area.

Floating Wave Attenuator

The proposed project includes a floating wave attenuator to improve tranquility for vessels on the outer main dock and Muller Bay dinghy dock. The goal of the floating wave attenuator is to reduce locally generated waves to improve comfort.

The proposed floating wave attenuator will be 380 ft long and 16 ft wide. The typical draft of the floating attenuator sections is 4.3 ft. The total overwater surface area of the floating attenuator will be 6,080 square ft at a water depth between 18 and 28 ft.

The floating attenuator is intended to be removable, so it is not in place during extreme events. The attenuator will be designed with a flexible (elastic) anchorage system and connections that allow for it to

be disconnected from the deck, floating units to be separated and towed to the drop well area, and units lifted and stored in land with a forklift. The marina management will determine if the attenuator is removed for the entire hurricane season or upon issuance of a tropical storm watch. Indicative anchorage locations are shown on the project Drawings; 38 helical anchors are anticipated for the removable floating attenuator.

Mooring Field

The mooring field includes 70 mooring buoys in Muller Bay, over 96 LF of berthing on two floating docks for dinghies, and upland support facilities such as showers, restrooms, and solid waste collection bins. Vessels in the mooring field will have access to the pump out at the fuel dock and will be prohibited by their mooring lease contract to discharge sewage or other pollutants.

The mooring field area will be identified with new markers and additional navigation aids will be installed to better identify the navigation channels. The Port Authority was consulted to validate the navigation channel and location of navigation aids. The following figure shows the docks in relationship to the ferry terminal and ferry navigation areas.

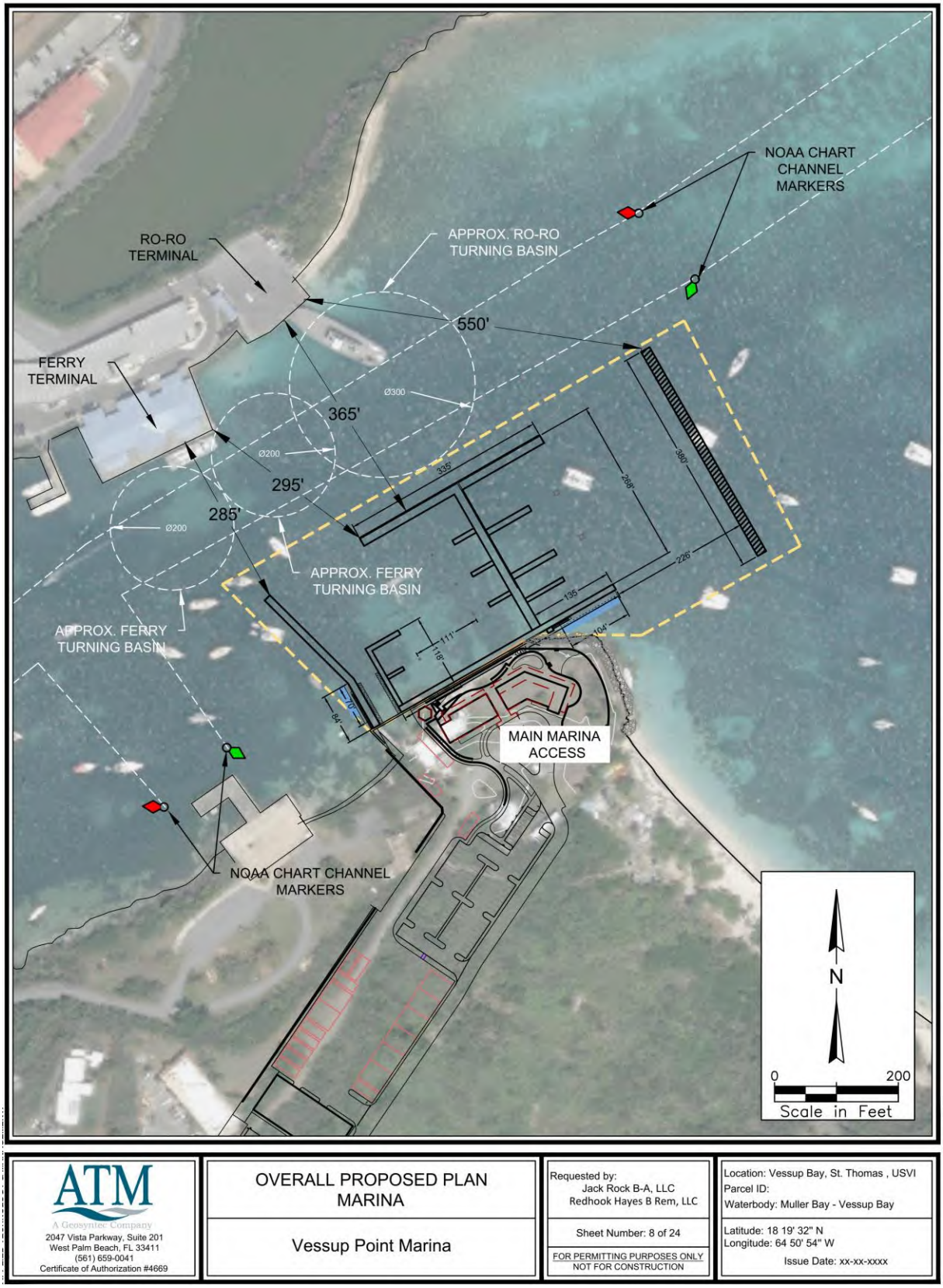


Figure 5.01 Navigational Areas

Proposed marina will maintain a high standard of operation, compatible with the vessel size and clientele expected. The marina operator will seek a Blue Flag, Clean Marina, or similar certification.

As part of its normal operation, the marina expects to:

- Establish and maintain a management plan that includes environmental management systems;
- Create and maintain an environmental policy that supports the implementation and updates of the environmental management plan;
- Display at the marina the code of conduct that reflects appropriate laws governing the use of the marina and surrounding areas;
- Display information relating to local eco-systems and the local environment;
- Provide marina and mooring lease agreements that include information about regulations, laws and permit conditions governing the use of the marina and its environmental management plan;
- Maintain the operation and promote the use of a sewage pump-out;
- Provide marina and mooring lease agreements that include the prohibition of discharge of sewage, bilge, oil or solid waste to the bay, as proper disposal procedures for fluid and solid waste will be available through the marina;
- Provide adequate and properly identified, segregated containers for the storage of waste oil and general solid waste;
- Provide adequate, clean, and well sign-posted sanitary facilities, including washing facilities are provided for the marina visitors and employees.
- Provide adequate and well signposted lifesaving, first-aid equipment, and fire-fighting equipment
- Prepare emergency plans in case of pollution, fire, or other accidents as part of an Approved Spill Prevention Control and Countermeasure Plan. Post safety precautions and information at the marina.
- Provide electricity and water in all marina slips and in-slip fueling in selected marina berths;
- Provide accommodations for disabled people are in place.
- A map indicating the location of the different facilities is posted at the marina

5.01b Presence and Location of any Critical Areas and Possible Trouble Spots

The subject parcels are within the Vessup Bay/ East End Red Hook Area of Particular Concern (APC) (Figure 5.01.1). The Vessup Bay/Red Hook APC is located on the eastern end of St. Thomas and includes Nazareth, Muller, Vessup, Red Hook, Great Bay, Cowpet Bay, Cabrita, Beck and Water Point, Great St. James, Little St, James, and Dog Island.

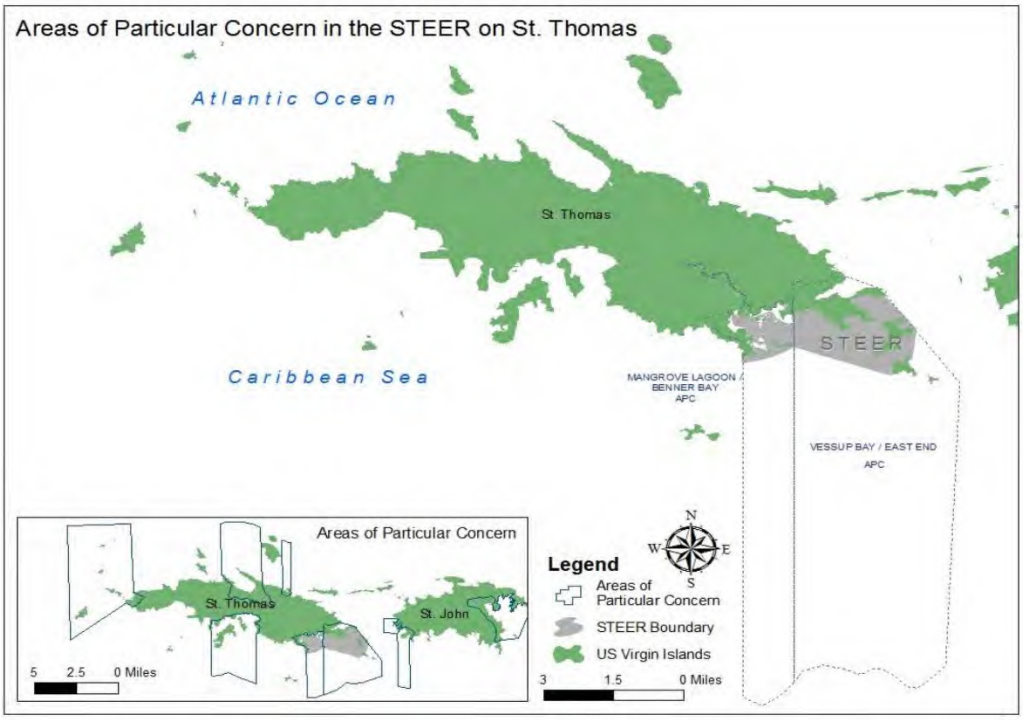


Figure 5.01.1 Areas of Particular Conern (STEER (2011) St. Thomas East End Reserve Management Plan. St. Thomas, USVI.

The Latitude 18 Marina has been developed since the 1980s. And prior to that the area was a sand operation. The marina docks were severely damaged by hurricane Hugo (1989), were repaired, and then were damaged again by hurricane Marilyn (1995), and only a portion would be rebuilt (CZT-7-95W). The marina was destroyed by hurricanes Irma and Maria 2017.

At one time dense seagrass, *Thalassia testudinum* was found in the eastern portion of the marina, however over time it has become less abundant, and the area is now fully mixed with the invasive seavine *Halophila stipulacea*. In early 2000 there was a *Dendrogyra cylindrus*, a coral which is now listed on the endangered species list, found on the riprap which rap around the point at the northeastern end of the property. Surveys in 2008 did not find this coral and no other ESA corals have been found on the shoreline revetment since that time. The piles and the shoreline revetment which faces north and is in Vessup Bay proper, is degraded habitat with significant algal colonization. These hard structures would not be considered critical habitat due to the amount of algal colonization. A few *Siderastrea spp.* and *Psuedodiploria spp.* are found in this area.

The riprap revetment which extends around the point into Muller Bay enjoys much better water quality and can be considered critical habitat. No construction is proposed for this area. There are scattered corals on the hardbottom although many of the corals were damaged due to a sailboat grounding on the riprap. The sailboat is still aground against the riprap.

There are emergent hard bottom areas to the east in Muller Bay, and there is sparse coral colonization on the emergent rock including *Orbicella faveolata* and *O. annularis* ESA listed coral species. The coral colonization increase to the east, and corals become abundant to the east of the proposed Managed Mooring Field. Each mooring location proposed has been surveyed and positioned to avoid hard bottom

impact and impact to corals. Two mooring buoy locations originally planned were relocated due to potential impacts on corals, while three remain in an area generally classified as hardbottom habitat, but will not impact corals or hardbottom as they have been located in sand pockets. All lines and tackle will be floated so as not to damage the seafloor or the corals.

While the invasive seavine is found through Vessup, Muller and Red Hook Bay, there are still expanses of *Thalassia testudinum* and *Syringodium filiforme*. These sea grass beds are badly damaged by existing mooring practices, anchoring, dragging lines and debris.

The managed mooring field should help to alleviate these impacts and should facilitate recolonization by these species.

The area is known habitat to protected sea turtles and marine mammals and as such NOAA's Sea Turtle and Smalltooth Sawfish Construction Conditions will be followed as well as NOAA's Vessel Strike Avoidance Measures and Reporting for Mariners during the construction of the dock and installation of the moorings. To minimize esonification issues a sea turtle protection plan will be implemented.

The property is with the critical habitat for the Virgin Islands Tree Boa and tree boas are known to occur within the area. Much of the main marina site is cleared and offers little in the way of habitat for these species. Habitat with good interdigitation exists in the overgrown western portions of the property and in some of the areas of denser vegetation near the beach. All areas slated for development will follow Tree Boa protocols and will be hand cleared before any machine work ensues. The Tree Boa protection plan has been modified to address all conditions in the FWS Biological Opinion and the USVI Tree Boa Guidelines.

While most of the site has gentle gradients, the existing paved roadway onto the site has excessive slopes. Access to the site is of concern both during construction and use. During the construction project Latitude will try to bring as many of the larger components to the site as possible by vessel, and all the dock components will come in by vessel. Improvements will have to be made in order to access the site during construction, Latitude 18 will repair any damage it causes during construction so that access is not impacted. Once the development is complete, Latitude 18 will resurface and pave the entire roadway. Latitude 18 will develop a maintenance plan for the roadway.

Vessup Bay and Muller Bay are directly downstream of the proposed construction site. Erosion control BMP's will be implemented to ensure the turbidity remains under the acceptable levels throughout construction. Also, constant attention will be required to ensure that erosion control measures are in place and maintained to protect the water quality of the bay below.

5.01c Method of Land Clearing

The project site is known endangered VI Tree Boa habitat therefore the Tree Boa clearing protocols will be followed. The site will first be hand cleared and rock and rubble piles will be taken apart by hand to allow any tree boas in the area to leave to more forested areas that will remain to the south southwest. Immediately following the hand clearing, erosion and sediment control measures will be put into place as described in the following Sections 5.01d – e of this report.

After the hand clearing, most of the site will be machine cleared and excavated at the beginning stages of construction. Existing trees will be removed by and disposed of as necessary according to the Tree Removal Plan. Trees that are designated to remain will be protected during construction.

Furthermore, only the land within the limits of construction will be cleared. The clearing activities will be scheduled so that the existing soil is exposed to erosion for the shortest period that is reasonably possible.

Land for the project area will be cleared by bulldozers and backhoes, which will remove brush that lies within the building site. Brush cleared from the site will be used in the construction of rock/gravel and brush berms to prevent erosion. Additional brush that cannot be utilized for berms will be removed to the Bovoni landfill. No burning will be allowed on the property. Brush will be cleared to the extent necessary for contractor operations.

The structures on the site will be constructed of concrete foundations and cisterns, steel-super structure with metal decking, concrete floors, exterior masonry walls, framed interior partitions, impact door and window assemblies, metal railings, and metal-framed roof structures with metal roofing.

5.01d Provisions to Preserve Topsoil and Limit Site Disturbance

As previously stated, immediately following site clearing, erosion and sediment control measures will be installed. Furthermore, all topsoil located during site clearing will be immediately excavated, stockpiled, and protected from exposure to wind and water using a geotextile. The topsoil will be used as necessary in the landscape areas.

The dock and mooring locations have been located to minimize impact on the marine environment by avoiding all ESA listed corals, non-ESA corals, seagrass, hardbottom and minimizing seagrass impacts. Turbidity control and water quality monitoring will be implemented as well as sea turtle monitoring to minimize acoustic impacts. Areas will be cleared by hand to minimize impact to the VI Tree Boa. A Tree Boa protection plan is found in Appendix C. This plan has been modified to address all conditions in the FWS Biological Opinion and the USVI Tree Boa Guidelines.

5.01h Method of Stormwater Management

The site does not currently have any ponds, swales, or other stormwater treatment measures. Given the site location on the edge of a small peninsula, there is little to no off-site flow coming through the site.

The on-site stormwater pond has been designed to meet or exceed the requirement set forth by the local governing authorities. The stormwater pond was designed to provide water quality treatment for the site immediately after a rainfall event. In this regard, water quality treatment entails collecting the initial flush of runoff during a rainfall event and allowing the sediments and nutrients to be settled and removed within the on-site pond. Per best management practices within the Saint John's River Water Management District, the criteria used to determine the water quality treatment volume was based on the greater volume of either 1" of rainfall across the entire site, or 2.5" of rainfall on impervious surfaces. Per the calculations, a greater volume of runoff was generated by the 2.5" of rainfall over the impervious

area. The volume created the 2.5" of runoff constitutes the "water quality" design parameter. This criterion is more stringent than the requirements that are set forth by the local governing jurisdiction, the Department of Planning & Natural Resources.
For any rainfall event, runoff generated on-site will be collected by stormwater inlets strategically located throughout the site. These inlets will initially direct the runoff through secondary stormwater piping to the primary stormwater pond. Under normal rainfall conditions the pond will allow for the settling of sediments and for the uptake of nutrients. In rainfalls which exceed the capacity of the pond the pond will serve to slow the discharge rate of the runoff and will allow some settling of larger particles and materials.
The pre and post development conditions have been modeled in AdICPR4 and shows that for each of the rainfall events run (2-year, 10-year, 25-year, and the 100-year), the post development discharge is lower than the predevelopment. The design is improving the discharge conditions by including the on-site stormwater pond.

Once the stormwater runoff reaches the elevation of the outfall structure weir crest, the water quality treatment of the first 2.5" of rainfall on the impervious surfaces will have been met. When runoff events occur beyond the 2.5" runoff will discharge over the control structure weir. The system has been designed such that the piping will discharge into the pond until it reach it reaches the 2.5" containment then it will begin overtopping the weir and flowing freely into the Bay.
In addition, oil-water separators will be installed downstream of each of the proposed boat washdown areas to prevent the introduction of oils and greases into the marine environment. The washdown runoff from these maintenance operations will be collected in a designated secondary stormwater system that will run through the oil-water separator and then into the on-site pond. A maintenance schedule will be implemented to ensure that oil water separators are cleaned out and collected oil is properly disposed of.

5.01k Method of Construction

Marina fixed docks be built primarily from construction barges, including the installation of piles and construction of deck and other dock elements. Mooring buoy and floating dock attenuator installation will be done with light floating equipment and with the assistance of divers to install the helix anchors. Bulkhead construction will be completed with land-based equipment.

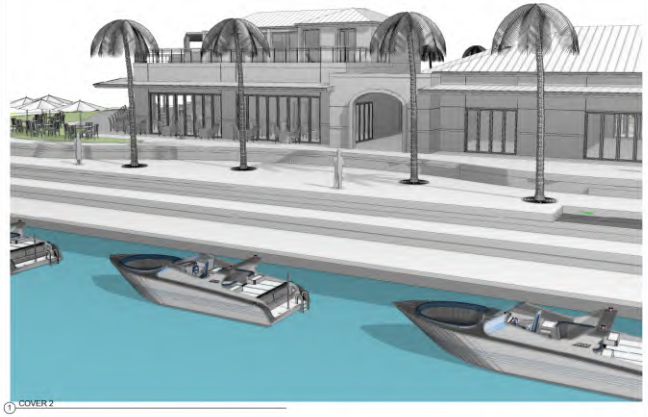
The material will be dredged with a clam shell or dragline from the shoreline or may be dredged from a small offshore barge. The material will be dewatered on shore in areas adjacent to the dredge area. The dredge spoil piles will be surrounded by silt fencing and haybales and a sandbag barrier. Dikes will be created from dredge material with a 1V:2H slope to create the dewatering area.

5.02 EXHIBITS AND DRAWINGS

LATITUDE 18 MARINA REDEVELOPMENT

REM. CONSOLIDATED 9B-A ESTATE NAZARETH - ST. THOMAS, U.S. VIRGIN ISLANDS
CZM REVISION | SUBMISSION DATE: DECEMBER 21, 2022

APPLICANT: JACK ROCK B-A C LLC



1 COVER 2

VICINITY MAP

NOT TO SCALE

LOCATION MAP

NOT TO SCALE

DRAWING INDEX

DRAWING INDEX	
SHEET NO.	**SHEET NAME**
GENERAL	
A100	COVER
A101	CZM INFORMATION
CIVIL	
C-001	NOTES SHEET
C-010	SURVEY SHEET
C-091-095	EROSION CONTROL DEMOLITION PLAN
C-100	OVERALL SITE PLAN
C-101-155	SITE PLAN
C-201-254	GRADING & DRAINAGE PLAN
C-301-354	UTILITY PLAN
C-400-410	DETAILS
ARCHITECTURAL	
A111	SITE PLAN
B-A101	WAREHOUSE - FLOOR PLANS
B-A121	WAREHOUSE - ELEVATIONS
B-A103	WAREHOUSE - ROOF PLAN
A112	LANDSCAPE & IRRIGATION PLAN
B-A102	WAREHOUSE - FOUNDATION PLANS
A-A101	MARINA BUILDING - FLOOR PLAN - CISTERN LEVEL
A-A111	MARINA BUILDING - FLOOR PLAN - FIRST FLOOR
A-A121	MARINA BUILDING - FLOOR PLAN - SECOND FLOOR
A-A112	MARINA BUILDING - FOUNDATION PLAN - FIRST FLOOR
A-A201	MARINA BUILDING - ELEVATIONS
A-A202	MARINA BUILDING - SECTIONS
A-A122	MARINA BUILDING - ROOF PLAN
A-A231	MARINA BUILDING - AXONOMETRIC VIEWS
A-A251	WAREHOUSE BUILDING - AXONOMETRIC VIEWS
A-A252	OVERALL SITE AXON
A-A233	VIEW FROM APARTMENT NEXT DOOR
A113	VICINITY PLAN
STRUCTURAL	
S1	SITE PLAN
S2	BULKHEAD SECTIONS
MARINA EXHIBITS	
M101	MARINA & MOORING EXHIBITS
M102	MARINA & MOORING EXHIBITS
M103	MARINA & MOORING EXHIBITS
M104	MARINA & MOORING EXHIBITS

PROJECT DIRECTORY

OWNER:
JACK ROCK B-A C LLC
Corporation Trust Center
1209 Orange Street
Wilmington, Delaware, 19801

CIVIL ENGINEER:
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1200 Hillcrest Street, Suite 200
Orlando, Florida, 32803
Contact: David Taylor, PE
Phone: 407-629-4777
Email: davidt@harriscivilengineers.com

DEVELOPMENT MANAGER:
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3350 Riverwood Parkway, Suite 2110
Atlanta, GA 30339
Contact: John Cooper
Phone: 404-229-6417
Email: jcooper@ams-hospitality.com

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ST. THOMAS, USVI, 00802
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Email: john.jwp.woods@gmail.com

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2110 Company Street
Christiansted, VI, 00820
Contact: Clarence Browne
Phone: 340-227-6265
Email: clarence@designdistrictvi.com

CONSULTING ARCHITECT:
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Coral Gables, FL, 33134
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Phone: 305-444-0990
Email: mb@eoagroup.com

GEOTECHNICAL ENGINEER:
MVG GEOTECHNICAL GROUP
P.O. Box 2636
Vega Baja, Puerto Rico, 00694
Contact: Marcus Garcia
Phone:787-354-5646
Email: mgarcia@mgvgeo.com

STRUCTURAL ENGINEER:
PFPE
9-1 Bellevue, PO Box 600122
St. Thomas, USVI, 00801
Contact: Paul Ferreras, PE
Phone: 340-714-5435
Email: paul@pfpe.pro

FUEL CONSULTANT:
PETROLEUM MARINE CONSTRUCTION
120 E. Oakland Park Blvd, Suite 105
Ft. Lauderdale, FL, 33334
Contact: Paul Doyle
Phone: 954-533-1199
Email: paul@petroleummarine.com

ENVIRONMENTAL CONSULTANT:
BIOIMPACT, INC.
P.O. Box 132 Kingshill
St. Croix, USVI 00851
Contact: Amy Claire Dempsey, MA
Phone: 340-690-8445
Email: bioimpact@islands.vi

LAND SURVEYOR-GEO REFERENCING:
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Contact: Ryan Wisehart
Phone: 340-774-5310
Email: rwisehart@visurveyors.com

MARINE/COASTAL ENGINEER:
APPLIED TECHNOLOGY + MANAGEMENT
2047 Vista Parkway, Suite 101
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Email: ebiondi@appliedtm.com

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Email: jeff@thegreenpiece.ud

LAND SURVEYOR + CONSULTANTS:
MARVIN BERNING AND ASSOCIATES
Office: 18-8 Estate Smith Bay
Mailing: 6501 Red Hook Plaza, Suite 201
Contact: Harry Gaurikoff, RLS
Phone: 340-775-6557
Email: hgvisurvey@gmail.com

ZONING REQUIREMENTS TABLE: W1

	REQUIRED/ALLOWED	PROVIDED
PARKING	76 PARKING SPACES	64 PARKING SPACES
PERMITTED DENSITY	2 DWELLING UNITS MAX	0 DWELLING UNITS
PERMITTED LOT OCCUPANCY	40% OF ZONING LOT AREA: 96,946 SF MAX.	18,784 SQUARE FEET OR 7.2%
LOT AREA	10,000 SQUARE FEET MIN.	242,122 SQUARE FEET (5.56 ACRES)
USABLE OPEN SPACE	30% OF ZONING LOT AREA: 72,636 SF MIN.	77,841 SF OR 32%
LOT WIDTH	MIN. 100 FEET	200+ FEET
FRONT YARD	MIN. 25 FEET	30+ FEET
SIDE YARDS	MIN. 10 FEET	20+ FEET
REAR YARD	MIN. 20 FEET	NA (SEE PLANS)
MAX. HEIGHT LIMIT	THREE STORIES	TWO STORIES

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ATM
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West Palm Beach, FL, 33411
Contact: Esteban Biondi
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ISSUANCES		
No.	Drawing Issue Description	Date
2	CZM APPLICATION	5/6/2021
3	CZM APPLICATION REVISION	1/10/2022
4	CZM APPLICATION REVISION	12/16/2022

LATITUDE 18 MARINA

REM. CONSOLIDATED 9B-A NAZARETH
ST. THOMAS, USVI
JACK ROCK B-A C LLC

COVER

Checker
Project Architect

2021002
Project No.

05.03.2021
Date

A100
Drawing No.

NOT ISSUED FOR CONSTRUCTION

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EB 9814

SCOPE DOCUMENTS

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No.	Drawing Issue Description	Date
1	CZM PRE-APP	2/11/2021
2	CZM APPLICATION	5/3/2021
3	CZM APPLICATION REVISION	1/15/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

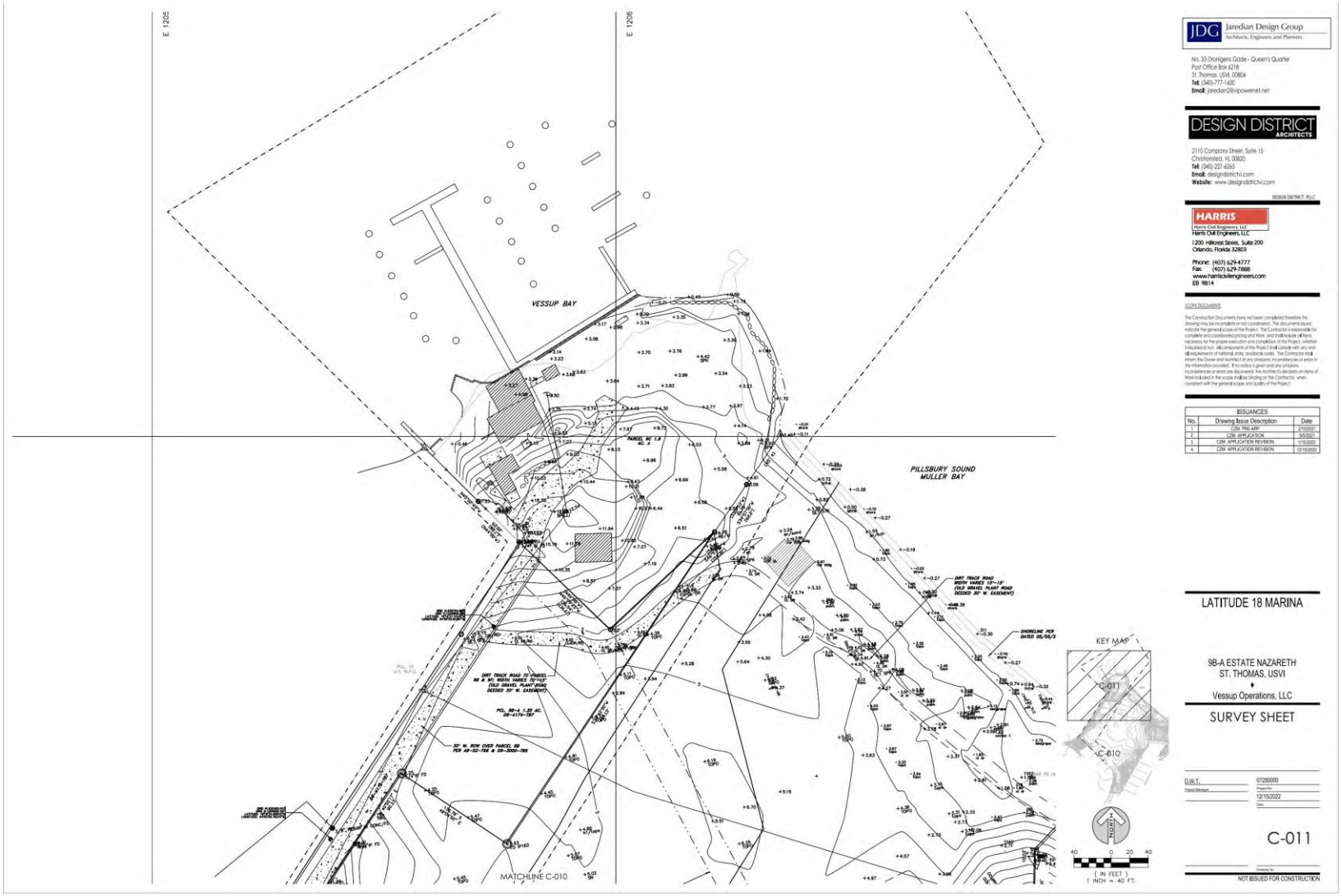
SURVEY SHEET

D.W.T.	07280000
Project Manager	Project No.
	12/15/2022
	Date

C-010

Drawing No.

NOT ISSUED FOR CONSTRUCTION



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CCPR DOCUMENTS

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1	CZM PRE-APP	2/10/2021
2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	1/15/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

SURVEY SHEET

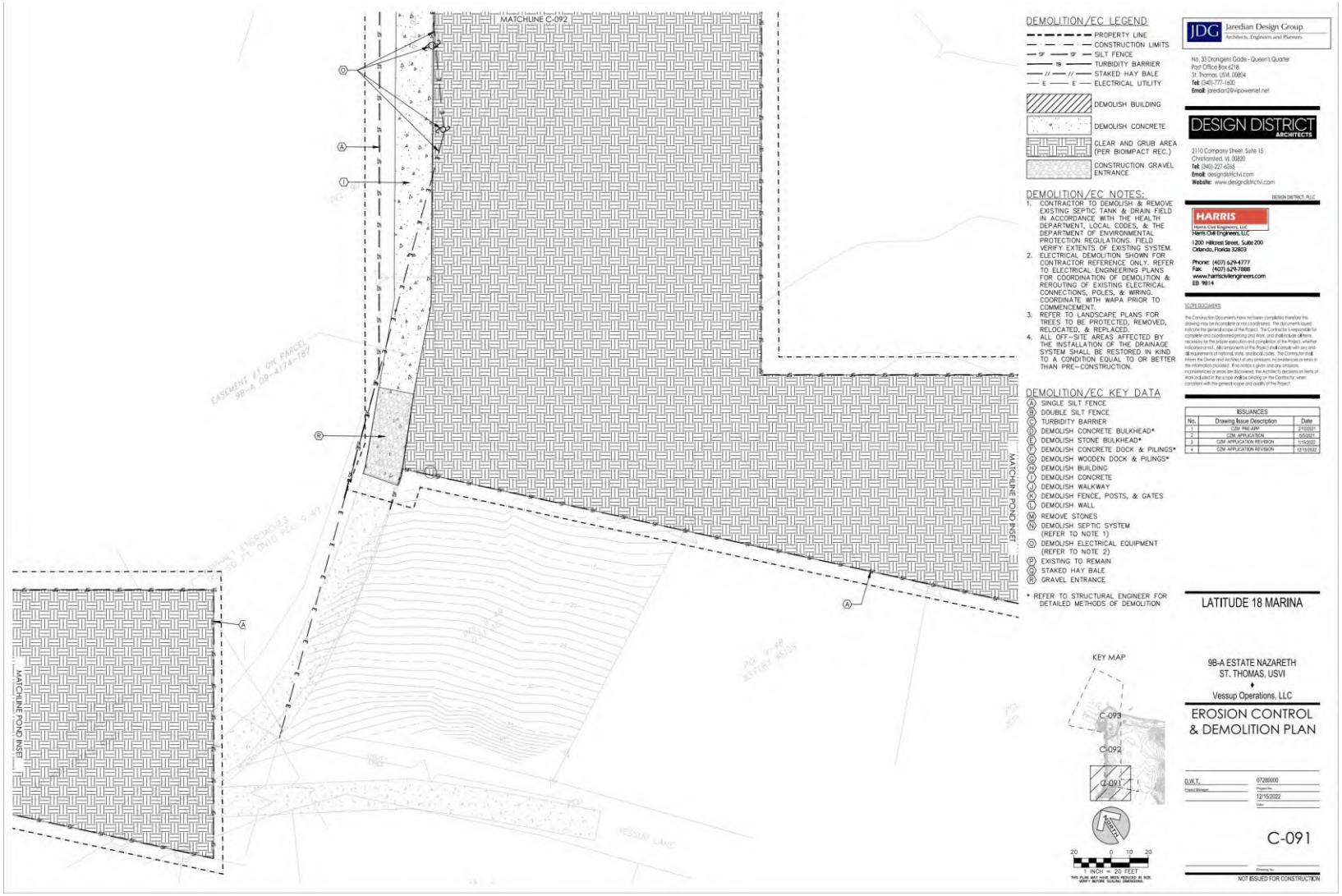
D.W.T.
Project Manager

07280000
Project No.

12/15/2022
Date

C-011
Drawing No.

NOT ISSUED FOR CONSTRUCTION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EASEMENT #1 ON PARCEL 98-A 09-4174-187
VESSUP LANE
DEMOLITION/EC LEGEND
PROPERTY LINE
CONSTRUCTION LIMITS
SF SF SILT FENCE
TB TURBIDITY BARRIER
STAKED HAY BALE
E E ELECTRICAL UTILITY
DEMOLISH BUILDING
DEMOLISH CONCRETE
CLEAR AND GRUB AREA (PER BIOIMPACT REC.)
CONSTRUCTION GRAVEL ENTRANCE
DEMOLITION/EC NOTES:
1. CONTRACTOR TO DEMOLISH & REMOVE EXISTING SEPTIC TANK & DRAIN FIELD IN ACCORDANCE WITH THE HEALTH DEPARTMENT, LOCAL CODES, & THE DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS. FIELD VERIFY EXTENTS OF EXISTING SYSTEM.
2. ELECTRICAL DEMOLITION SHOWN FOR CONTRACTOR REFERENCE ONLY. REFER TO ELECTRICAL ENGINEERING PLANS FOR COORDINATION OF DEMOLITION & REROUTING OF EXISTING ELECTRICAL CONNECTIONS, POLES, & WIRING. COORDINATE WITH WAPA PRIOR TO COMMENCEMENT.
3. REFER TO LANDSCAPE PLANS FOR TREES TO BE PROTECTED, REMOVED, RELOCATED, & REPLACED.
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DEMOLITION/EC KEY DATA
(A) SINGLE SILT FENCE
(B) DOUBLE SILT FENCE
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(E) DEMOLISH STONE BULKHEAD*
(F) DEMOLISH CONCRETE DOCK & PILINGS*
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(L) DEMOLISH WALL
(M) REMOVE STONES
(N) DEMOLISH SEPTIC SYSTEM (REFER TO NOTE 1)
(O) DEMOLISH ELECTRICAL EQUIPMENT (REFER TO NOTE 2)
(P) EXISTING TO REMAIN
(Q) STAKED HAY BALE
(R) GRAVEL ENTRANCE
* REFER TO STRUCTURAL ENGINEER FOR DETAILED METHODS OF DEMOLITION
KEY MAP
C-093
C-092
C-091
20 0 10 20
1 INCH = 20 FEET
THIS PLAN MAY HAVE BEEN REDUCED IN SIZE. VERIFY BEFORE SCALING DIMENSIONS.
JDG Jaredian Design Group
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ISSUANCES
No. | Drawing Issue Description | Date
1 | CZM PRE-APP | 2/10/2021
2 | CZM APPLICATION | 5/5/2021
3 | CZM APPLICATION REVISION | 1/15/2022
4 | CZM APPLICATION REVISION | 12/15/2022
LATITUDE 18 MARINA
98-A ESTATE NAZARETH
ST. THOMAS, USVI
Vessup Operations, LLC
EROSION CONTROL & DEMOLITION PLAN
D.W.T.
07280000
12/15/2022
C-091
NOT ISSUED FOR CONSTRUCTION

DEMOLITION/EC LEGEND

- PROPERTY LINE
- CONSTRUCTION LIMITS
- SF — SF — SILT FENCE
- TB — TB — TURBIDITY BARRIER
- // — // — STAKED HAY BALE
- E — E — ELECTRICAL UTILITY
- DEMOLISH BUILDING
- DEMOLISH CONCRETE
- CLEAR AND GRUB AREA (PER BIOIMPACT REC.)
- CONSTRUCTION GRAVEL ENTRANCE

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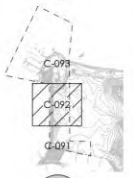
KEY MAP



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SCOPE/DISCLAIMER

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4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

EROSION CONTROL & DEMOLITION PLAN

D.W.T.
Project Manager:

07280000
Project No.
12/15/2022
Date

C-092
Drawing No.

NOT ISSUED FOR CONSTRUCTION

DEMOLITION/EC LEGEND

- PROPERTY LINE
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- SF — SF — SILT FENCE
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KEY MAP

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EB 9814

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LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

EROSION CONTROL & DEMOLITION PLAN

D.W.T.
Project Manager

07280000
Project No.

12/15/2022
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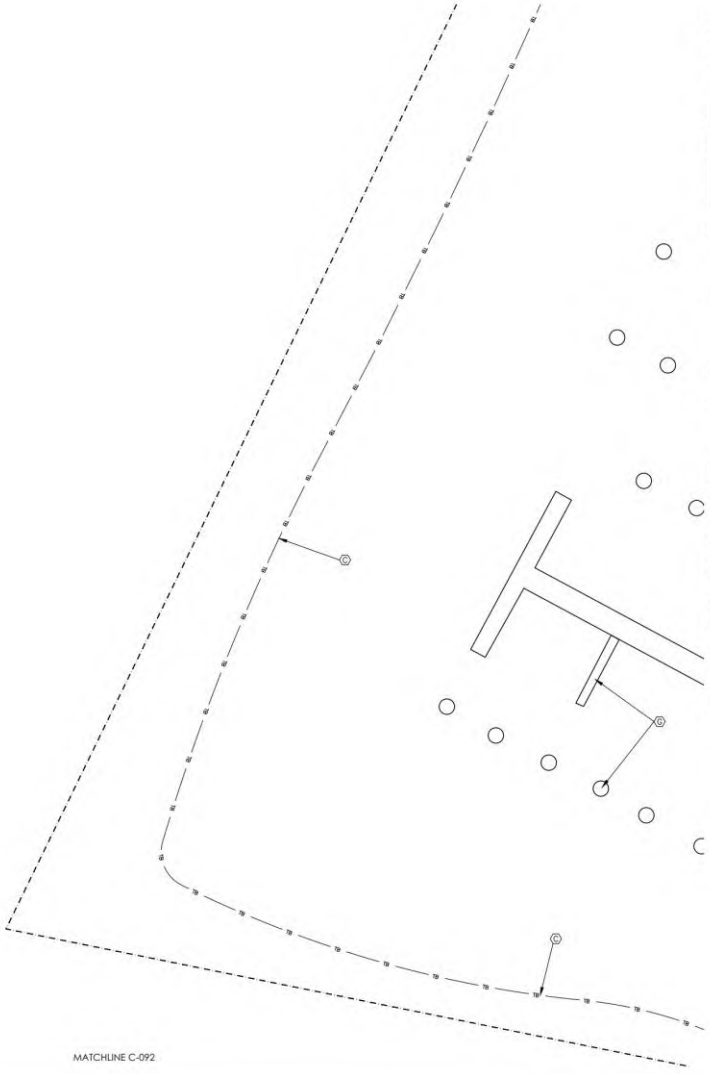
C-093
Drawing No.

NOT ISSUED FOR CONSTRUCTION



DEMOLITION/EC LEGEND

- PROPERTY LINE
- CONSTRUCTION LIMITS
- SF — SF — SILT FENCE
- TB — TURBIDITY BARRIER
- // — // — STAKED HAY BALE
- E — E — ELECTRICAL UTILITY
- DEMOLISH BUILDING
- DEMOLISH CONCRETE
- CLEAR AND GRUB AREA (PER BIOIMPACT REC.)
- CONSTRUCTION GRAVEL ENTRANCE

DEMOLITION/EC NOTES:

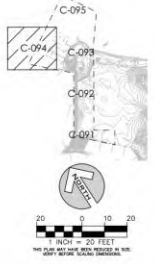
1. CONTRACTOR TO DEMOLISH & REMOVE EXISTING SEPTIC TANK & DRAIN FIELD IN ACCORDANCE WITH THE HEALTH DEPARTMENT, LOCAL CODES, & THE DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS. FIELD VERIFY EXTENTS OF EXISTING SYSTEM.
2. ELECTRICAL DEMOLITION SHOWN FOR CONTRACTOR REFERENCE ONLY. REFER TO ELECTRICAL ENGINEERING PLANS FOR COORDINATION OF DEMOLITION & REROUTING OF EXISTING ELECTRICAL CONNECTIONS, POLES, & WIRING. COORDINATE WITH WAPA PRIOR TO COMMENCEMENT.
3. REFER TO LANDSCAPE PLANS FOR TREES TO BE PROTECTED, REMOVED, RELOCATED, & REPLACED.
4. ALL OFF-SITE AREAS AFFECTED BY THE INSTALLATION OF THE DRAINAGE SYSTEM SHALL BE RESTORED IN KIND TO A CONDITION EQUAL TO OR BETTER THAN PRE-CONSTRUCTION.

DEMOLITION/EC KEY DATA

- (A) SINGLE SILT FENCE
- (B) DOUBLE SILT FENCE
- (C) TURBIDITY BARRIER
- (D) DEMOLISH CONCRETE BULKHEAD*
- (E) DEMOLISH STONE BULKHEAD*
- (F) DEMOLISH CONCRETE DOCK & PILINGS*
- (G) DEMOLISH WOODEN DOCK & PILINGS*
- (H) DEMOLISH BUILDING
- (I) DEMOLISH CONCRETE
- (J) DEMOLISH WALKWAY
- (K) DEMOLISH FENCE, POSTS, & GATES
- (L) DEMOLISH WALL
- (M) REMOVE STONES
- (N) DEMOLISH SEPTIC SYSTEM (REFER TO NOTE 1)
- (O) DEMOLISH ELECTRICAL EQUIPMENT (REFER TO NOTE 2)
- (P) EXISTING TO REMAIN
- (Q) STAKED HAY BALE
- (R) GRAVEL ENTRANCE

* REFER TO STRUCTURAL ENGINEER FOR DETAILED METHODS OF DEMOLITION

KEY MAP



20 0 10 20
1 INCH = 20 FEET
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ISSUANCES		
No.	Drawing Issue Description	Date
1	CZM PRE-APP	2/10/2021
2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	1/15/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

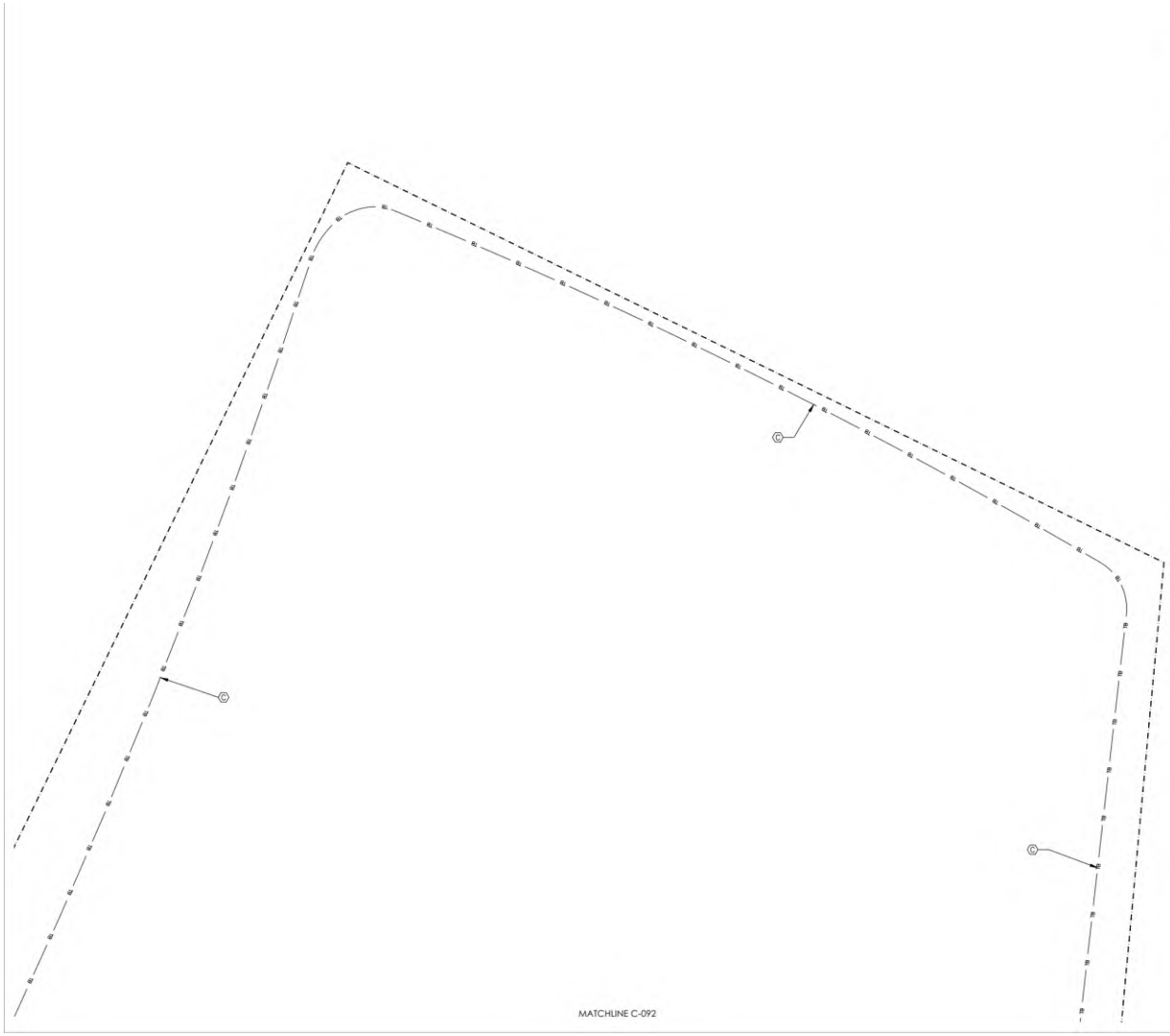
Vessup Operations, LLC

EROSION CONTROL & DEMOLITION PLAN

D.W.T. — Project Manager
07280000 — Project No.
12/15/2022 — Date

C-094 — Drawing No.

NOT ISSUED FOR CONSTRUCTION



DEMOLITION/EC LEGEND

- PROPERTY LINE
- CONSTRUCTION LIMITS
- SF — SF — SILT FENCE
- TB — TURBIDITY BARRIER
- // — // — STAKED HAY BALE
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- DEMOLISH BUILDING
- DEMOLISH CONCRETE
- CLEAR AND GRUB AREA (PER BIOIMPACT REC.)
- CONSTRUCTION GRAVEL ENTRANCE

DEMOLITION/EC NOTES:

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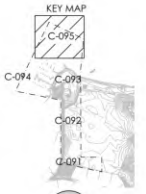
* REFER TO STRUCTURAL ENGINEER FOR DETAILED METHODS OF DEMOLITION

KEY MAP



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ISSUANCES

No.	Drawing Issue Description	Date
1	CZM PRE-APP	2/10/2021
2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	11/5/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

EROSION CONTROL & DEMOLITION PLAN

D.W.T. — Project Manager
07280000 — Project No.
12/15/2022 — Date

C-095 — Drawing No.

NOT ISSUED FOR CONSTRUCTION

SITE DATA

ZONING:
EXISTING: W-1 (WATERFRONT PLEASURE)
PROPOSED: W-1 (WATERFRONT PLEASURE)

BUILDING DATA

BUILDING HEIGHTS:
MAX. ALLOWABLE: 3 STORIES
MAX. PROPOSED: 2 STORIES

SETBACKS:
BUILDING SETBACKS:
FRONT: 25 FEET
SIDE: 10 FEET
REAR: 20 FEET

LOT COVERAGE TABLE

BUILDING:	18,371 SF (0.422 AC)
CONCRETE PAVE:	110,816 SF (2.543 AC)
GRAVEL PAVE:	35,323 SF (0.811 AC)
LANDSCAPE:	52,641 SF (1.208 AC)
POND:	25,258 SF (0.579 AC)
TOTAL:	242,409 SF (5.565 AC)

OPEN SPACE TABLE

*MINIMUM 30% OPEN SPACE REQUIRED
IMPERVIOUS AREA: 3.769 AC (68%)
PERVIOUS AREA: 1.787 AC (32%)

UTILITIES

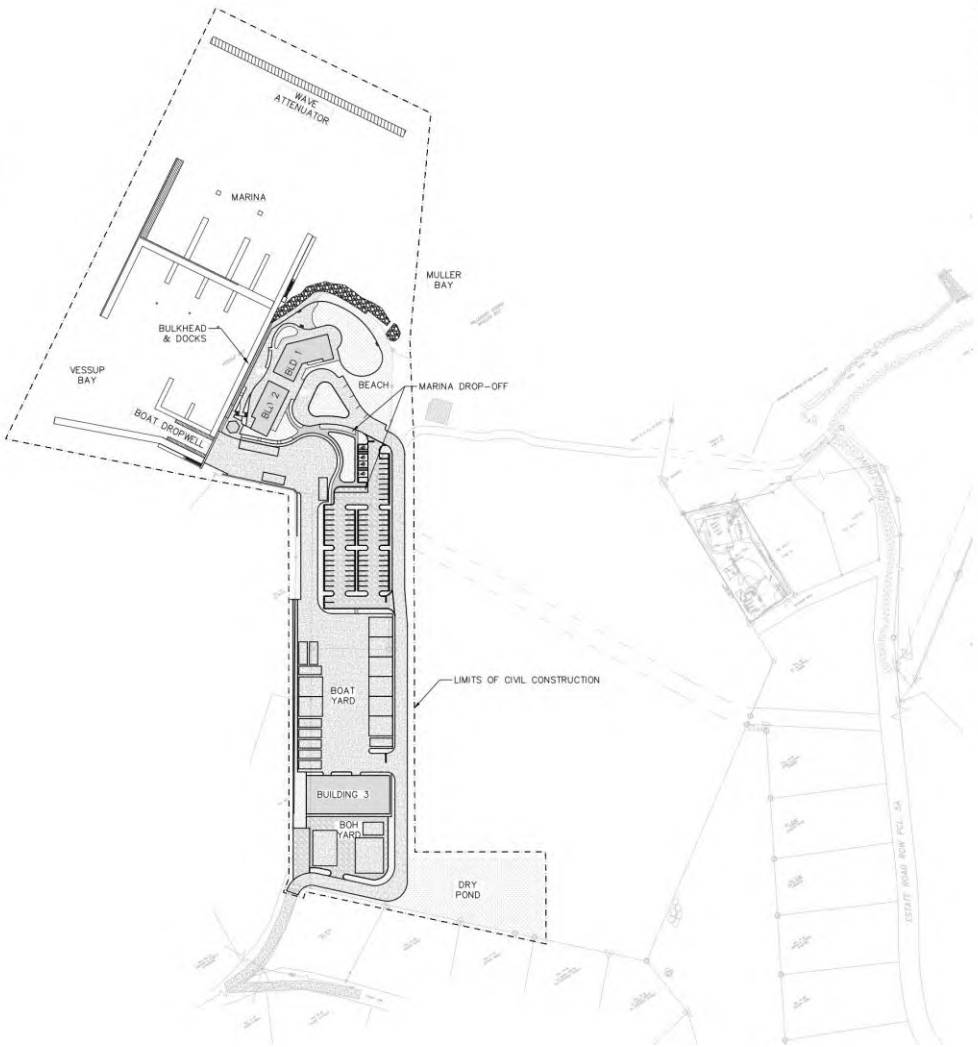
POTABLE WATER:	PRIVATE
FIRE PROTECTION:	PRIVATE
RECLAIMED WATER:	PRIVATE
SANITARY SEWER:	PRIVATE
ELECTRIC:	WAPA
SOLID WASTE:	TBD
NATURAL GAS:	NOT AVAILABLE
TELEPHONE:	TBD

PARKING DATA

PARKING STALL CRITERIA:

RESTAURANT:	1 PER 10 PATRONS
RETAIL:	1 PER 500 GROSS SF
OFFICE:	1 PER 500 GROSS SF
STAFF:	1 PER 5 EMPLOYEES
MARINA SLIPS:	1 PER 5 SLIPS
MOORINGS:	1 PER 10 BUOYS
DRYSTACKS:	1 PER 4 RACKS
ADA PARKING:	1 PER 25 REGULAR

STALLS REQUIRED:	72 STALLS
STALLS PROVIDED:	80 STALLS
ADA REQUIRED:	4 STALLS
ADA PROVIDED:	4 STALLS
TOTAL REQUIRED:	76 STALLS
TOTAL PROVIDED:	84 STALLS



OVERALL SITE LEGEND

- PROPERTY LINE
- CIVIL CONSTRUCTION LIMITS
- BUILDING FOOTPRINT
- CONCRETE PAVEMENT
- GRAVEL PAVEMENT

50 0 25 50
1 INCH = 50 FEET

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2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	1/19/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

OVERALL SITE PLAN

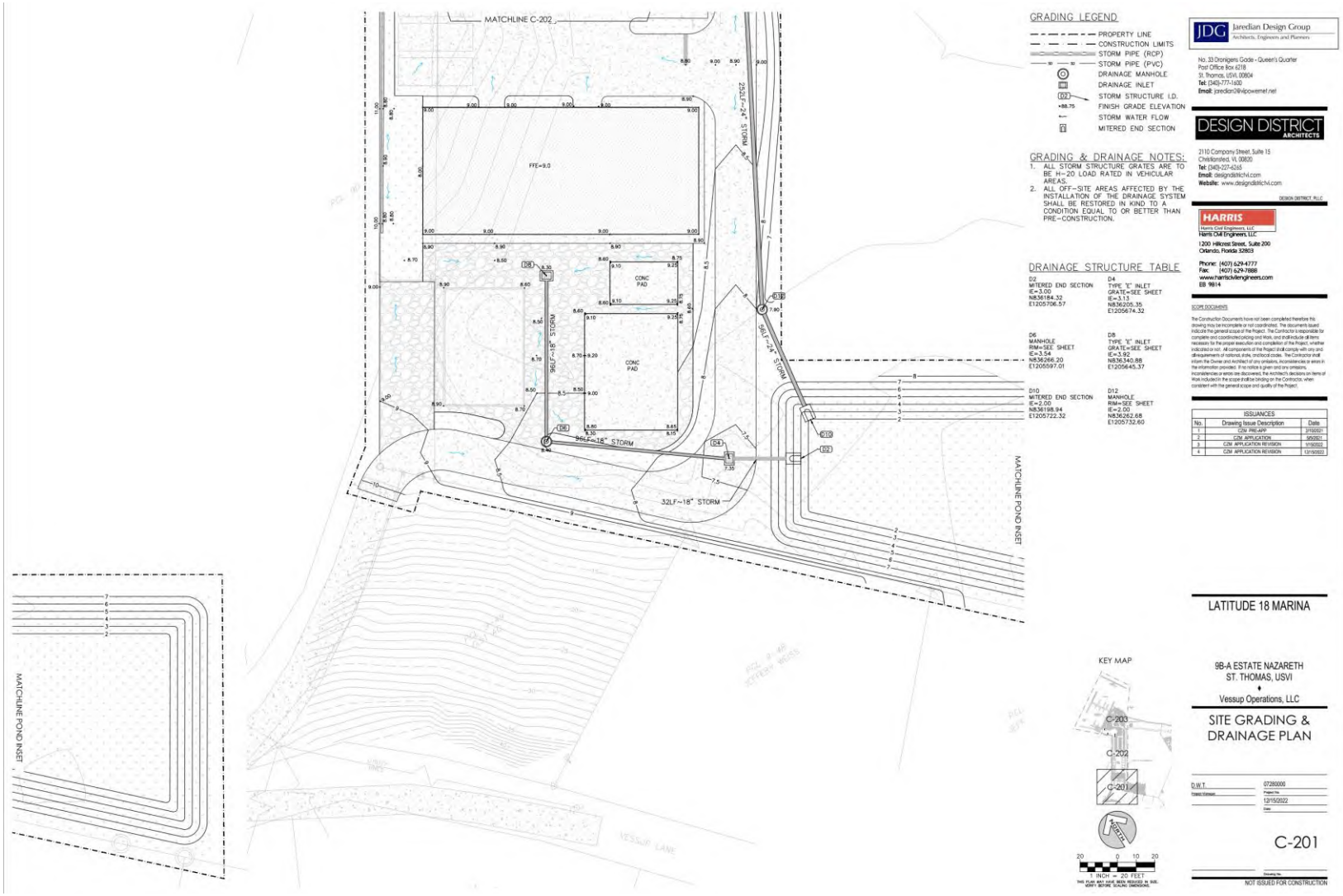
D.W.T.
Project Manager

07280000
Project No.

12/15/2022
Date

C-100
Drawing No.

NOT ISSUED FOR CONSTRUCTION



GRADING LEGEND

- PROPERTY LINE
- CONSTRUCTION LIMITS
- STORM PIPE (RCP)
- STORM PIPE (PVC)
- DRAINAGE MANHOLE
- DRAINAGE INLET
- STORM STRUCTURE I.D.
- FINISH GRADE ELEVATION
- STORM WATER FLOW
- MITERED END SECTION

GRADING & DRAINAGE NOTES:

1. ALL STORM STRUCTURE GRATES ARE TO BE H-20 LOAD RATED IN VEHICULAR AREAS.
2. ALL OFF-SITE AREAS AFFECTED BY THE INSTALLATION OF THE DRAINAGE SYSTEM SHALL BE RESTORED IN KIND TO A CONDITION EQUAL TO OR BETTER THAN PRE-CONSTRUCTION.

DRAINAGE STRUCTURE TABLE

D2 MITERED END SECTION IE=3.00 N836184.32 E1205706.57	D4 TYPE "E" INLET GRATE=SEE SHEET IE=3.13 N836205.35 E1205674.32
D6 MANHOLE RIM=SEE SHEET IE=3.54 N836266.20 E1205597.01	D8 TYPE "E" INLET GRATE=SEE SHEET IE=3.92 N836340.88 E1205645.37
D10 MITERED END SECTION IE=2.00 N836198.94 E1205722.32	D12 MANHOLE RIM=SEE SHEET IE=2.00 N836262.68 E1205732.60

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No.	Drawing Issue Description	Date
1	CZM PRE-APP	2/10/2021
2	CZM APPLICATION	9/5/2021
3	CZM APPLICATION REVISION	1/19/2022
4	CZM APPLICATION REVISION	12/19/2022

KEY MAP

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

SITE GRADING & DRAINAGE PLAN

D.W.T.
Project Manager

07280000
Project No.
12/15/2022
Date

C-201
Drawing No.

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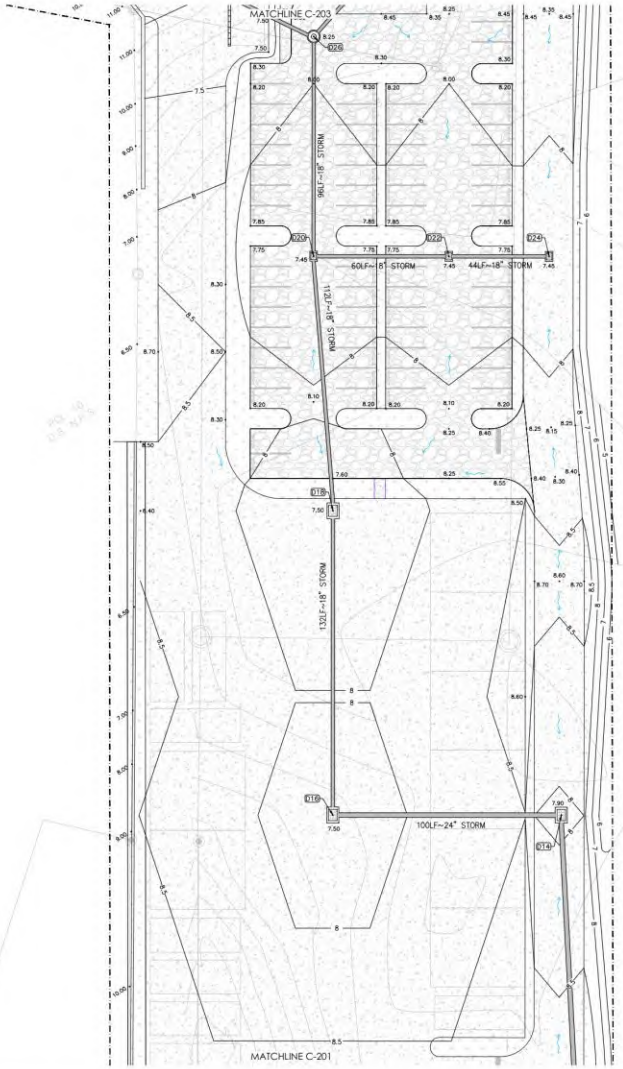

GRADING LEGEND

- PROPERTY LINE
- CONSTRUCTION LIMITS
- STORM PIPE (ROP)
- STORM PIPE (PVC)
- DRAINAGE MANHOLE
- DRAINAGE INLET
- D2 — STORM STRUCTURE I.D.
- •88.75 — FINISH GRADE ELEVATION
- STORM WATER FLOW
- MITERED END SECTION

GRADING & DRAINAGE NOTES:

1. ALL STORM STRUCTURE GRATES ARE TO BE H-20 LOAD RATED IN VEHICULAR AREAS.
2. ALL OFF-SITE AREAS AFFECTED BY THE INSTALLATION OF THE DRAINAGE SYSTEM SHALL BE RESTORED IN KIND TO A CONDITION EQUAL TO OR BETTER THAN PRE-CONSTRUCTION.

DRAINAGE STRUCTURE TABLE

D14
TYPE 'E' INLET
GRATE=SEE SHEET
IE=2.00
N836483.57
E1205860.22

D16
TYPE 'E' INLET
GRATE=SEE SHEET
IE=2.00
N836538.67
E1205775.34

D18
TYPE 'E' INLET
GRATE=SEE SHEET
IE=2.00
N836651.76
E1205848.67

D20
TYPE 'E' INLET
GRATE=SEE SHEET
IE=2.00/2.58
N836751.10
E1205902.85

D22
TYPE 'C' INLET
GRATE=SEE SHEET
IE=2.82
N836718.46
E1205953.14

D24
TYPE 'C' INLET
GRATE=SEE SHEET
IE=3.00
N836694.29
E1205990.38

D26
CONTROL STRUCTURE
*SEE DETAILS FOR INFO
RIM=SEE SHEET
IE=2.00/2.50
N836832.78
E1205955.86

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3	CZM APPLICATION REVISION	1/15/2022
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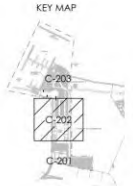
LATITUDE 18 MARINA

KEY MAP



9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

SITE GRADING & DRAINAGE PLAN

D.W.T.
Project Manager

07280000
Project No.

12/15/2022
Date

C-202
Drawing No.

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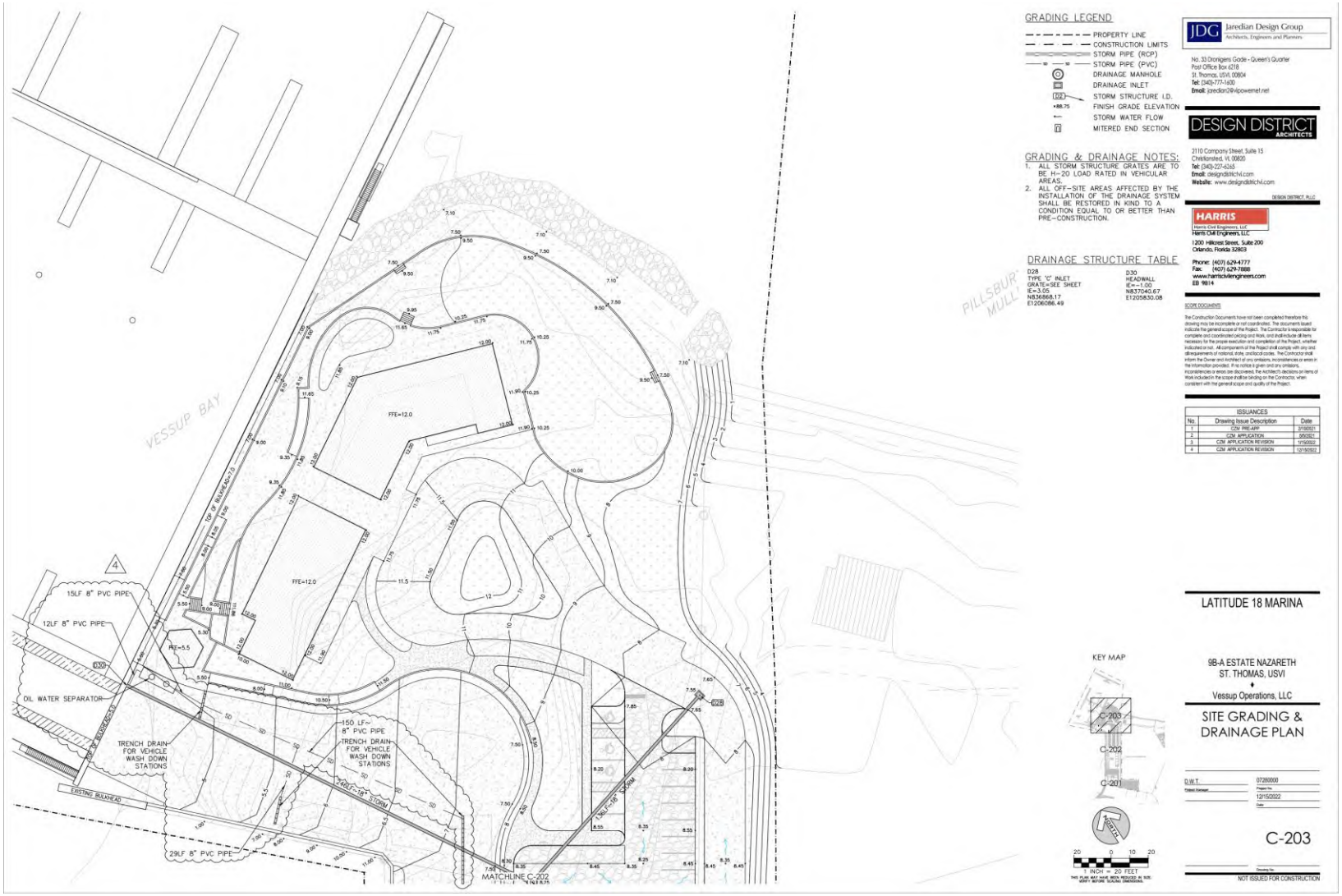

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2	CZM APPLICATION	8/5/2021
3	CZM APPLICATION REVISION	1/19/2022
4	CZM APPLICATION REVISION	12/19/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

SITE GRADING & DRAINAGE PLAN

D.W.T.
Project Manager

07280000
Project No.

12/15/2022
Date

C-203
Drawing No.

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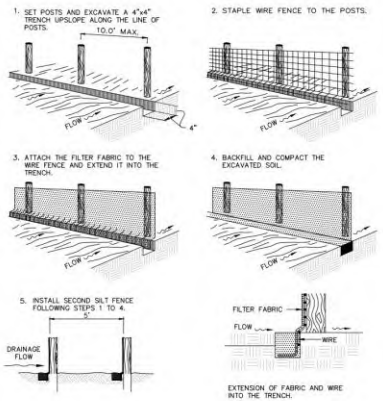
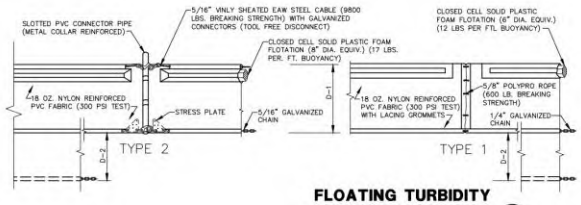


DOUBLE SILT FENCE DETAIL 1/400

N.T.S.



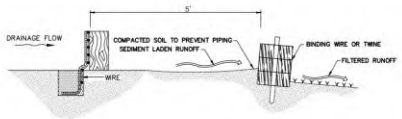
FLOATING TURBIDITY BARRIER DETAIL 3/400

N.T.S.

D-1= 5' STD. (SINGLE PANEL FOR DEPTHS 5' OR LESS).
D-2= 5' STD. (ADDITIONAL PANEL FOR DEPTHS > 5').

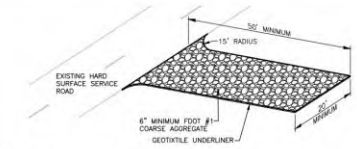
CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET, TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DETERMINED BY THE ENGINEER.

NOTICE:
COMPONENTS OF TYPES 1 AND 2 MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES 1 AND 2 SHALL BE AS APPROVED BY THE ENGINEER.



STRAW BALE & SILT FENCE SEPARATION DETAIL 4/400

N.T.S.

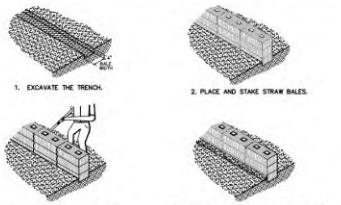


GENERAL NOTES:

1. A SOIL TRACKING PREVENTION DEVICE (STPD) SHALL BE CONSTRUCTED AT LOCATIONS DESIGNATED BY THE ENGINEER FOR POINTS OF EGRESS FROM UNSTABILIZED AREAS OF THE PROJECT TO ROADS WHERE OFFSITE TRACKING OF MUD COULD OCCUR. TRAFFIC FROM UNSTABILIZED AREAS OF THE CONSTRUCTION PROJECT SHALL BE DIRECTED THRU A CSCE. BARRIERS, FLAGGING, OR OTHER POSITIVE MEANS SHALL BE USED AS REQUIRED TO LIMIT AND DIRECT VEHICULAR EGRESS ACROSS THE CSCE.
2. THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE TECHNIQUE TO MINIMIZE OFFSITE TRACKING OF SEDIMENT. THE ALTERNATIVE MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO USE.
3. ALL MATERIALS SPILLED, DROPPED, OR TRACKED ONTO ROADS (INCLUDING THE CSCE AGGREGATE AND CONSTRUCTION MUD) SHALL BE REMOVED DAILY, OR MORE FREQUENTLY IF SO DIRECTED BY THE ENGINEER.
4. AGGREGATES SHALL BE AS DESCRIBED IN FDOT SECTION 901 EXCLUDING 901-2.3. AGGREGATES SHALL BE FDOT SIZE #1. IF THIS SIZE IS NOT AVAILABLE, THE NEXT AVAILABLE SMALLER SIZE AGGREGATE MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. SIZES CONTAINING EXCESSIVE SMALL AGGREGATE WILL TRACK OFF THE PROJECT AND ARE UNSUITABLE.
5. THE CSCE SHALL BE MAINTAINED IN A CONDITION THAT WILL ALLOW IT TO PERFORM ITS FUNCTION. TO PREVENT OFFSITE TRACKING, THE CSCE SHALL BE RINSED (DAILY WHEN IN USE) TO MOVE ACCUMULATED MUD DOWNWARD THRU THE STONE. ADDITIONAL STABILIZATION OF THE VEHICULAR ROUTE LEADING TO THE STPD MAY BE REQUIRED TO LIMIT THE MUD TRACKED.
6. A CSCE SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR CRUSH STONE CONSTRUCTION ENTRANCE, EA. THE UNIT PRICE SHALL CONSTITUTE FULL COMPENSATION FOR CONSTRUCTION, MAINTENANCE, REPLACEMENT OF MATERIALS, REMOVAL, AND RESTORATION OF THE AREA UTILIZED FOR THE CSCE; INCLUDING BUT NOT LIMITED TO EXCAVATION, GRADING, TEMPORARY PIPE (INCLUDING MES WHEN REQUIRED), FILTER FABRIC, AGGREGATE, PAVED TURNOUT (INCLUDING MES WHEN REQUIRED), FILTER DITCH STABILIZATION, APPROACH REROUTE STABILIZATION, SEDIMENT REMOVAL AND DISPOSAL, GRADING AND SOD.
7. THE NOMINAL SIZE OF A STANDARD CSCE INS 20' x 50' UNLESS OTHERWISE SHOWN IN THE PLANS. IF THE VOLUME OF ENTERING AND EXITING VEHICLES WARRANT, A 30' WIDTH CSCE MAY BE USED IF APPROVED BY THE ENGINEER. WHEN A DOUBLE WIDTH (30') CSCE IS USED, THE PAY QUANTITY SHALL BE 1.5 FOR EACH LOCATION.

CRUSHED STONE CONSTRUCTION ENTRANCE DETAIL 2/400

N.T.S.



STRAW BALE BARRIER DETAIL 5/400

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EB 9814

ISSUANCES

No.	Drawing Issue Description	Date
1	CZM PRE-APP	2/10/2021
2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	1/15/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

9B-A ESTATE NAZARETH
ST. THOMAS, USVI

Vessup Operations, LLC

DETAILS

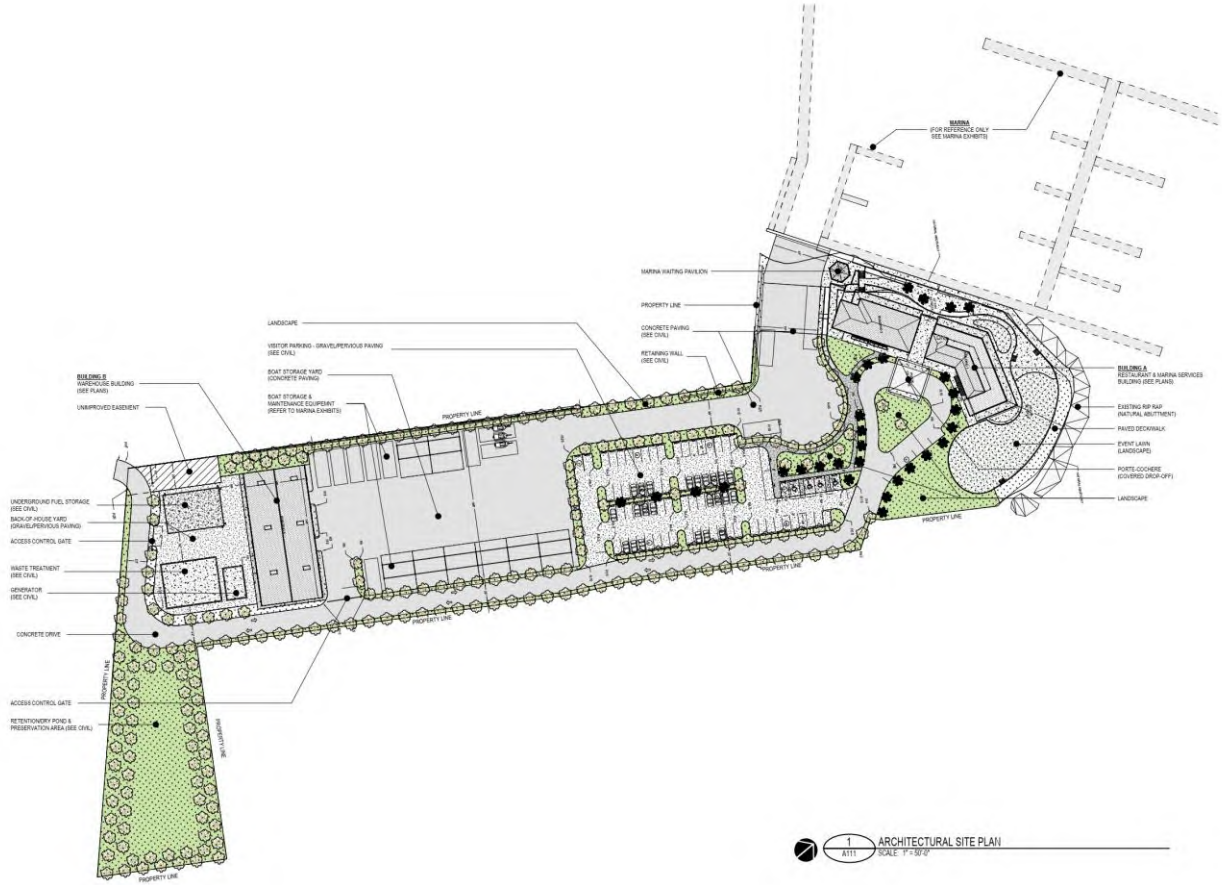
D.W.T.
Project Manager

07280000
Project No.

12/15/2022
Date

C-400
Drawing No.

NOT ISSUED FOR CONSTRUCTION



1 A111 ARCHITECTURAL SITE PLAN
SCALE: 1" = 50'-0"

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ISSUANCES		
No.	Drawing Issue Description	Date
2	CZM APPLICATION	5/6/2021
3	CZM APPLICATION REVISION	1/10/2022
4	CZM APPLICATION REVISION	12/16/2022

LATITUDE 18 MARINA

REM. CONSOLIDATED 9B-A NAZARETH
ST. THOMAS, USVI

JACK ROCK B-A C LLC

SITE PLAN

C.B.	2021002
Project Architect	Project No.
	05.03.2021
	Date

A111
Drawing No.

NOT ISSUED FOR CONSTRUCTION

TREE LEGEND

SYMBOL	QTY.	CATEGORY	COMMON	BOTANICAL
		LEGACY TREES	MAMPOO	
			MAHOGANY	
			TURF	
		SHADE TREES	SEA GRAPE	
			LIGNUM VITAE	
		FLOWERING TREES OR PLANTS	SEA LAVENDER	ARGUSIA GNAPHALODES
			JAMAICAN CAPER	CAPARIS CYNOPHALLAPHORA
			WHITE FRANGIPANI	PLUMERIA ALBA
			COCO PLUM	CHRYSOBALANUS ICACO
		PALMS	QUEEN PALMS	
			ROYAL PALMS	
		CONSERVATION AREA (PRUNED AND MAINTAINED NATURAL VEGETATION)		

TREE LEGEND
1" = 40'-0"

1 / A112 LANDSCAPE & IRRIGATION PLAN
SCALE: 1" = 50'-0"

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3	CZM APPLICATION REVISION	7/19/2022
4	CZM APPLICATION REVISION	12/19/2022

LATITUDE 18 MARINA

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LANSCAPE & IRRIGATION PLAN

Checker	2021002
Project Architect	Project No.
	05.03.2021
	Date

A112
Drawing No.

NOT ISSUED FOR CONSTRUCTION

1 A-A111 LEVEL 01 - MARINA
SCALE: 1/16" = 1'-0"

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No.	Drawing Issue Description	Date
2	CZM APPLICATION	5/6/2021
3	CZM APPLICATION REVISION	1/19/2022
4	CZM APPLICATION REVISION	12/16/2022

LATITUDE 18 MARINA

REM. CONSOLIDATED 9B-A NAZARETH
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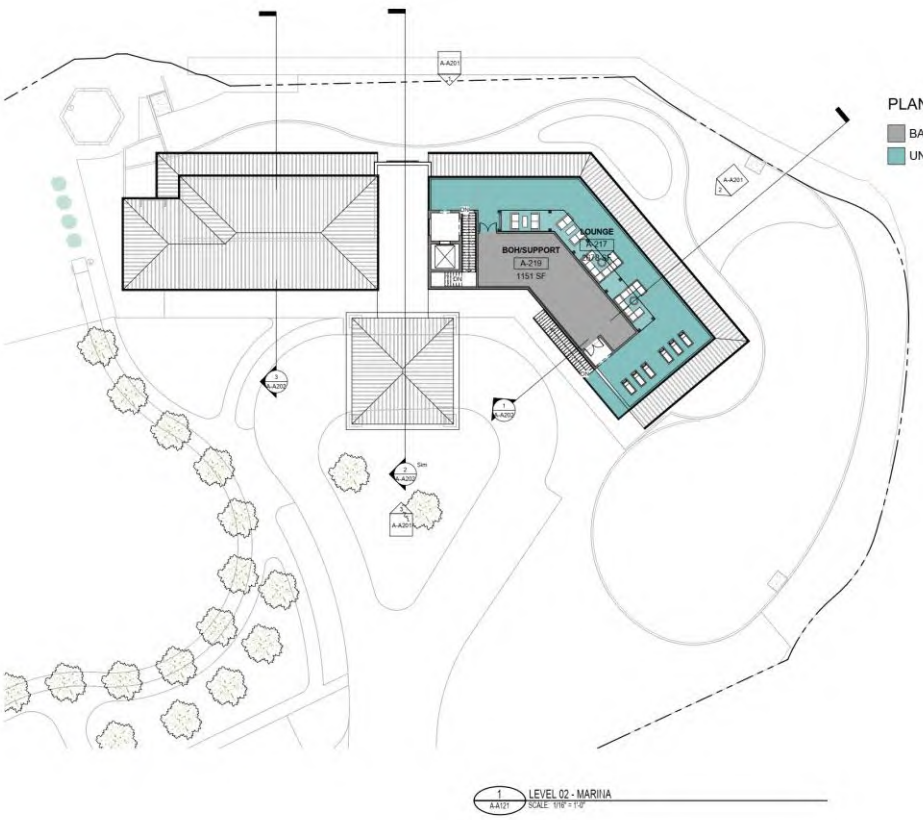
JACK ROCK B-A C LLC

MARINA BUILDING - FLOOR PLAN - FIRST FLOOR

Checker	2021002
Project Architect	Project No.
	05.03.2021
	Date

A-A111
Drawing No.

NOT ISSUED FOR CONSTRUCTION



PLAN LEGEND

BACK OF HOUSE & SUPPORT

UNCONDITIONED

1 A-A121 LEVEL 02 - MARINA
SCALE: 1/16" = 1'-0"

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ISSUANCES		
No.	Drawing Issue Description	Date
2	CZM APPLICATION	5/6/2021
3	CZM APPLICATION REVISION	1/19/2022
4	CZM APPLICATION REVISION	12/16/2022

LATITUDE 18 MARINA

REM. CONSOLIDATED 9B-A NAZARETH
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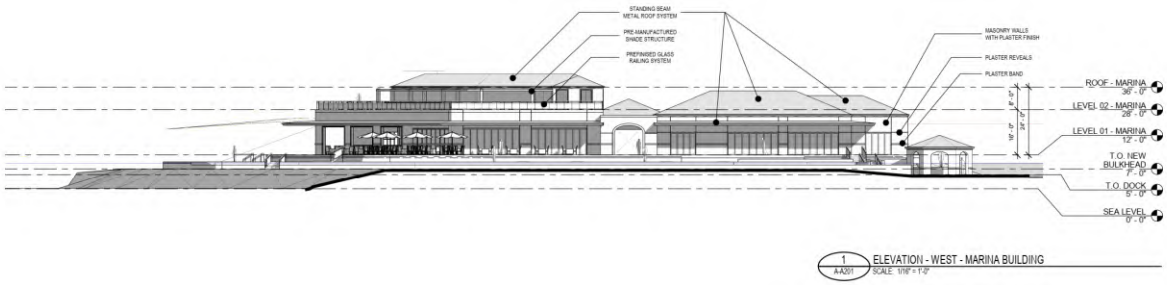
MARINA BUILDING - FLOOR PLAN - SECOND FLOOR

Checker	2021002
Project Architect	Project No.
	05.03.2021
	Date

A-A121

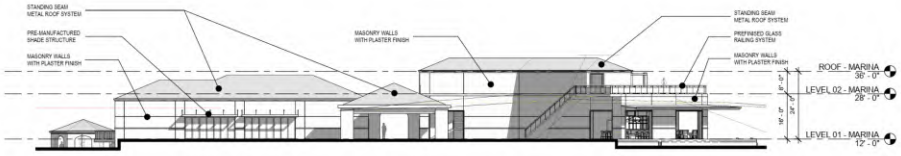
Drawing No.

NOT ISSUED FOR CONSTRUCTION



1 A-A201 ELEVATION - WEST - MARINA BUILDING
SCALE: 1/16" = 1'-0"

2 A-A201 ELEVATION - NORTH - MARINA BUILDING
SCALE: 1/16" = 1'-0"



3 A-A201 ELEVATION - EAST - MARINA BUILDING
SCALE: 1/16" = 1'-0"

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ISSUANCES		
No.	Drawing Issue Description	Date
2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	11/16/2022
4	CZM APPLICATION REVISION	12/15/2022

LATITUDE 18 MARINA

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MARINA BUILDING - ELEVATIONS

Checker
Project Architect
2021002
Project No.
05.03.2021
Date

A-A201
Drawing No.

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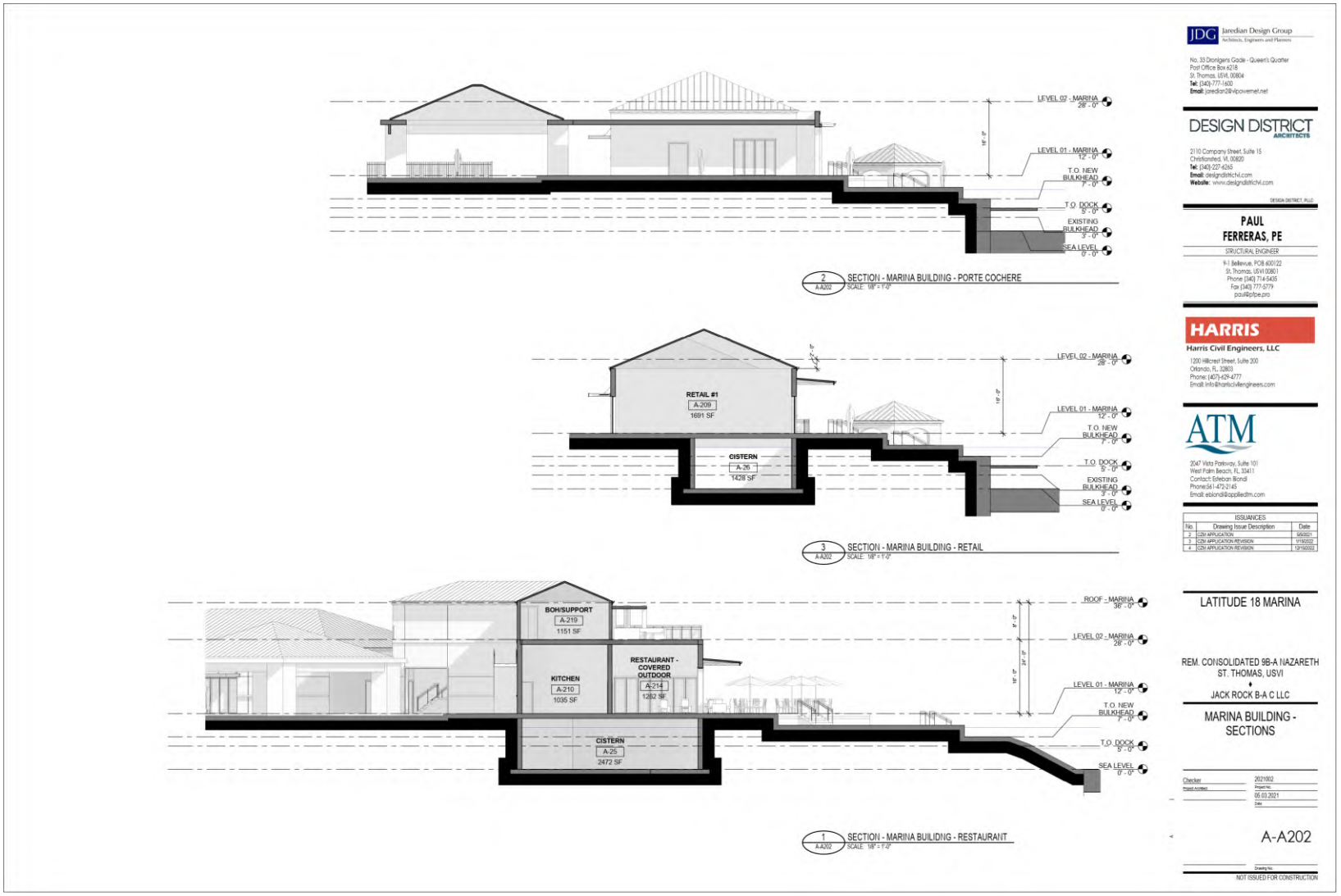

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2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	11/16/2022
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LATITUDE 18 MARINA

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MARINA BUILDING - SECTIONS

Checker
Project Architect
2021002
Project No.
05.03.2021
Date

A-A202
Drawing No.

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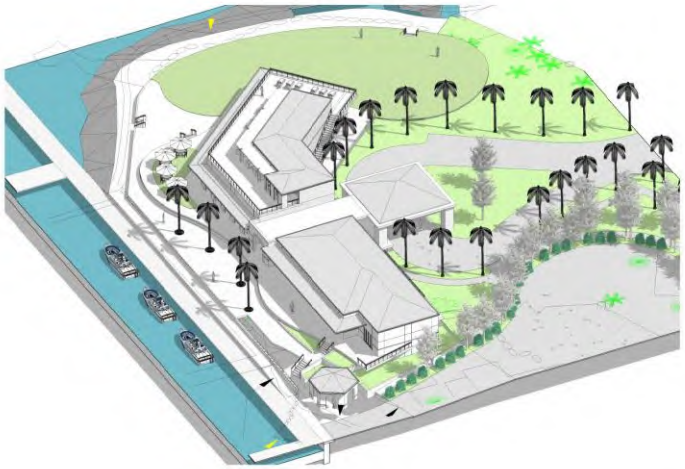

1 A-A231 MARINA BUILDING AXON NE
SCALE

2 A-A231 MARINA BUILDING AXON NW
SCALE

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LATITUDE 18 MARINA

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MARINA BUILDING -
AXONOMETRIC VIEWS

Checker
Project Architect

2021002
Project No.

05.03.2021
Date

A-A231
Drawing No.

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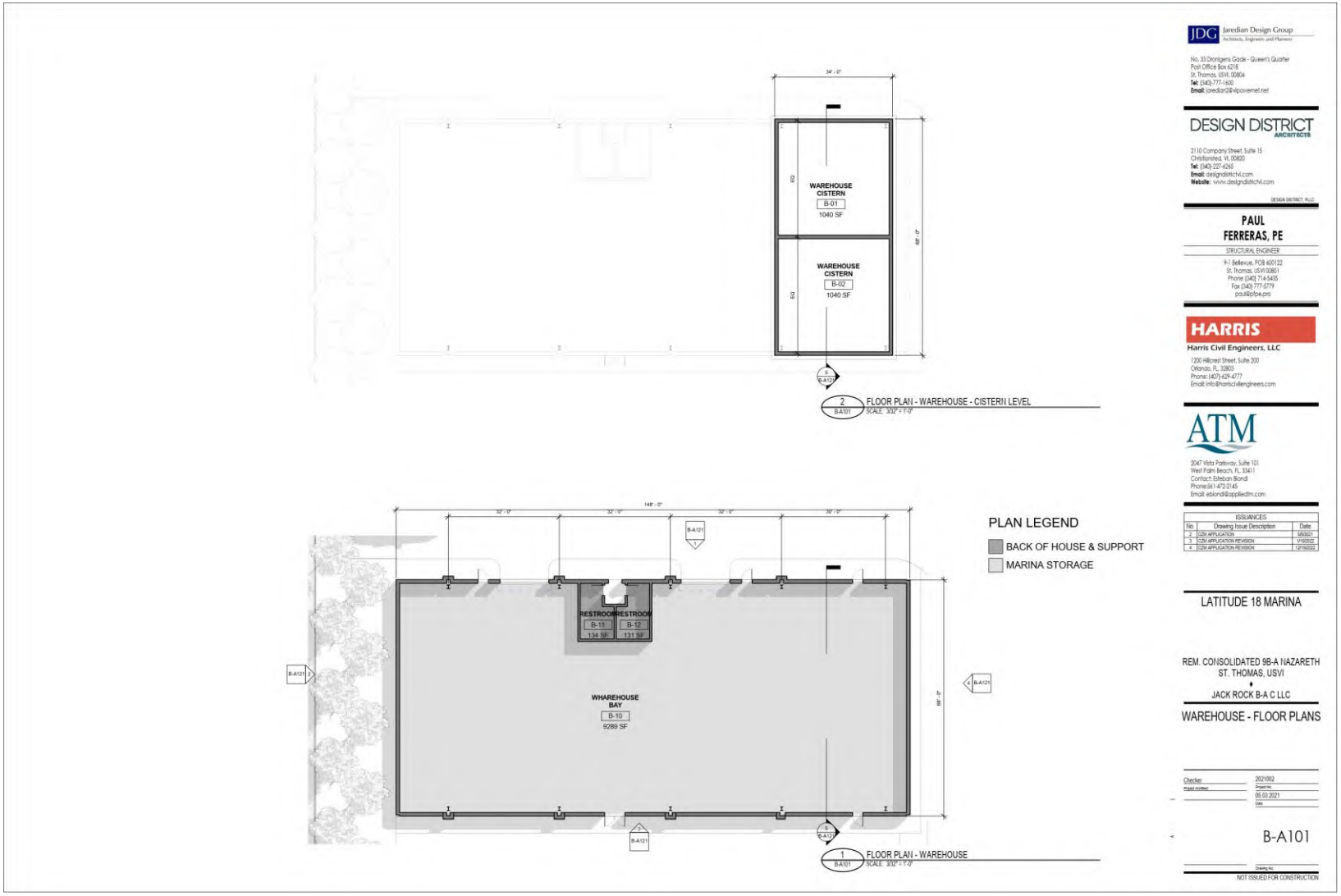
WAREHOUSE CISTERN
B-01
1040 SF
WAREHOUSE CISTERN
B-02
1040 SF
FLOOR PLAN - WAREHOUSE - CISTERN LEVEL
SCALE: 3/32" = 1'-0"
RESTROOM
B-11
134 SF
RESTROOM
B-12
131 SF
WHAREHOUSE BAY
B-10
9289 SF
FLOOR PLAN - WAREHOUSE
SCALE: 3/32" = 1'-0"
PLAN LEGEND
BACK OF HOUSE & SUPPORT
MARINA STORAGE
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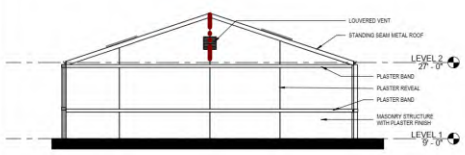
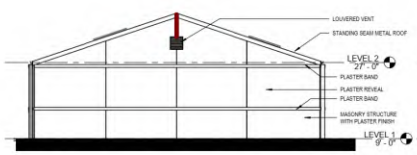
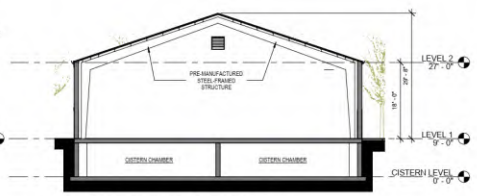
ISSUANCES
No. | Drawing Issue Description | Date
2 | CZM APPLICATION | 5/6/2021
3 | CZM APPLICATION REVISION | 11/10/2022
4 | CZM APPLICATION REVISION | 12/16/2022
LATITUDE 18 MARINA
REM. CONSOLIDATED 9B-A NAZARETH
ST. THOMAS, USVI
JACK ROCK B-A C LLC
WAREHOUSE - FLOOR PLANS
Checker
Project Architect
2021002
Project No.
05.03.2021
Date
B-A101
Drawing No.
NOT ISSUED FOR CONSTRUCTION



2 B-A121 WAREHOUSE BLDG - NORTH ELEVATION
SCALE: 3/32" = 1'-0"



4 B-A121 WAREHOUSE BLDG - SOUTH ELEVATION
SCALE: 3/32" = 1'-0"



5 B-A121 WAREHOUSE BLDG - CROSS SECTION
SCALE: 3/32" = 1'-0"

3 B-A121 WAREHOUSE BLDG - WEST ELEVATION
SCALE: 3/32" = 1'-0"

1 B-A121 WAREHOUSE BLDG - EAST ELEVATION
SCALE: 3/32" = 1'-0"

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paul@pfpe.pro

HARRIS
Harris Civil Engineers, LLC
1200 Hillcrest Street, Suite 200
Orlando, FL, 32803
Phone: (407)-629-4777
Email: Info@harriscivilengineers.com

ATM
2047 Vista Parkway, Suite 101
West Palm Beach, FL, 33411
Contact: Esteban Biondi
Phone:561-472-2145
Email: ebiondi@appliedtm.com

ISSUANCES		
No.	Drawing Issue Description	Date
2	CZM APPLICATION	5/5/2021
3	CZM APPLICATION REVISION	11/16/2022
4	CZM APPLICATION REVISION	12/16/2022

LATITUDE 18 MARINA

REM. CONSOLIDATED 9B-A NAZARETH
ST. THOMAS, USVI

JACK ROCK B-A C LLC

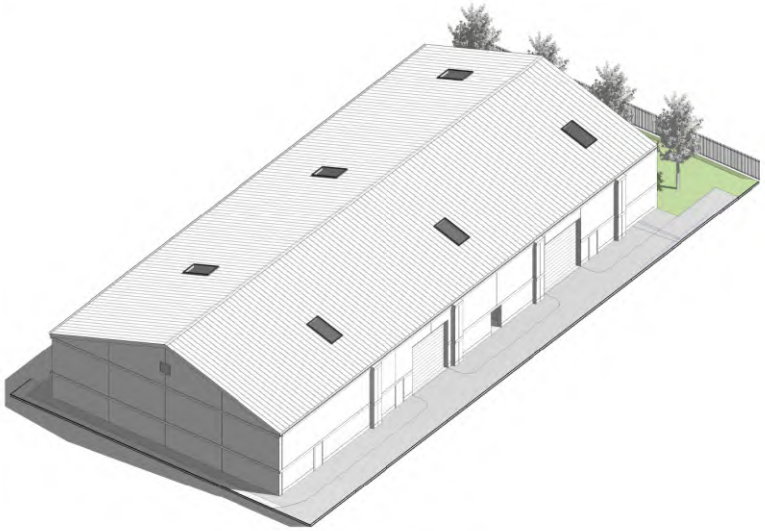
WAREHOUSE - ELEVATIONS

Checker
Project Architect

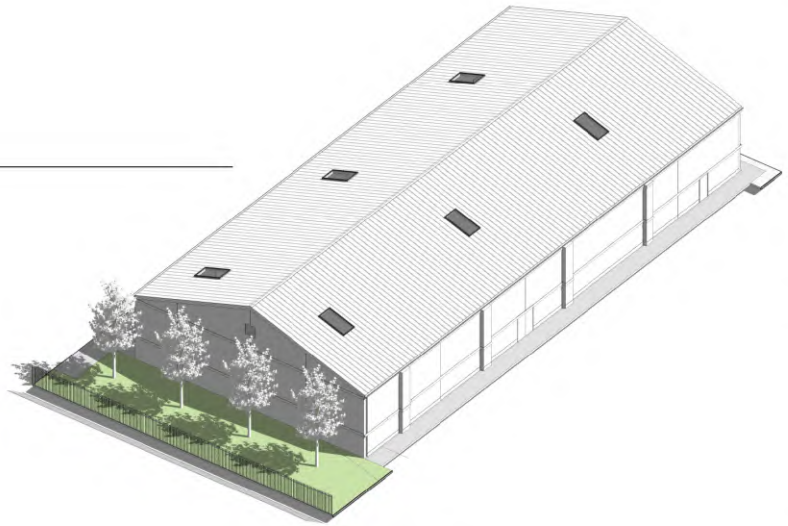
2021002
Project No.
05.03.2021
Date

B-A121
Drawing No.

NOT ISSUED FOR CONSTRUCTION



2 B-A231 WAREHOUSE BUILDING AXON SE
SCALE:



1 B-A231 WAREHOUSE BUILDING AXON NW
SCALE:

JDG Jaredian Design Group
Architects, Engineers and Planners
No. 33 Dronigens Gade - Queen's Quarter
Post Office Box 6218
St. Thomas, USVI, 00804
Tel: (340)-777-1600
Email: jaredian2@vipovernet.net

DESIGN DISTRICT
ARCHITECTS
2110 Company Street, Suite 15
Christiansted, VI, 00820
Tel: (340)-227-6265
Email: designdistrictvi.com
Website: www.designdistrictvi.com
DESIGN DISTRICT, PLLC

PAUL
FERRERAS, PE
STRUCTURAL ENGINEER
9-1 Bellevue, POB 600122
St. Thomas, USVI 00801
Phone (340) 714-5435
Fax (340) 777-5779
paul@pfpe.pro

HARRIS
Harris Civil Engineers, LLC
1200 Hillcrest Street, Suite 200
Orlando, FL, 32803
Phone: (407)-629-4777
Email: Info@harriscivilengineers.com

ATM
2047 Vista Parkway, Suite 101
West Palm Beach, FL, 33411
Contact: Esteban Bondi
Phone:561-472-2145
Email: ebondi@appliedtm.com

ISSUANCES		
No.	Drawing Issue Description	Date
2	CZM APPLICATION	6/6/2021
3	CZM APPLICATION REVISION	11/5/2022
4	CZM APPLICATION REVISION	12/16/2022

LATITUDE 18 MARINA

REM. CONSOLIDATED 9B-A NAZARETH
ST. THOMAS, USVI

JACK ROCK B-A C LLC

WAREHOUSE BUILDING -
AXONOMETRIC VIEWS

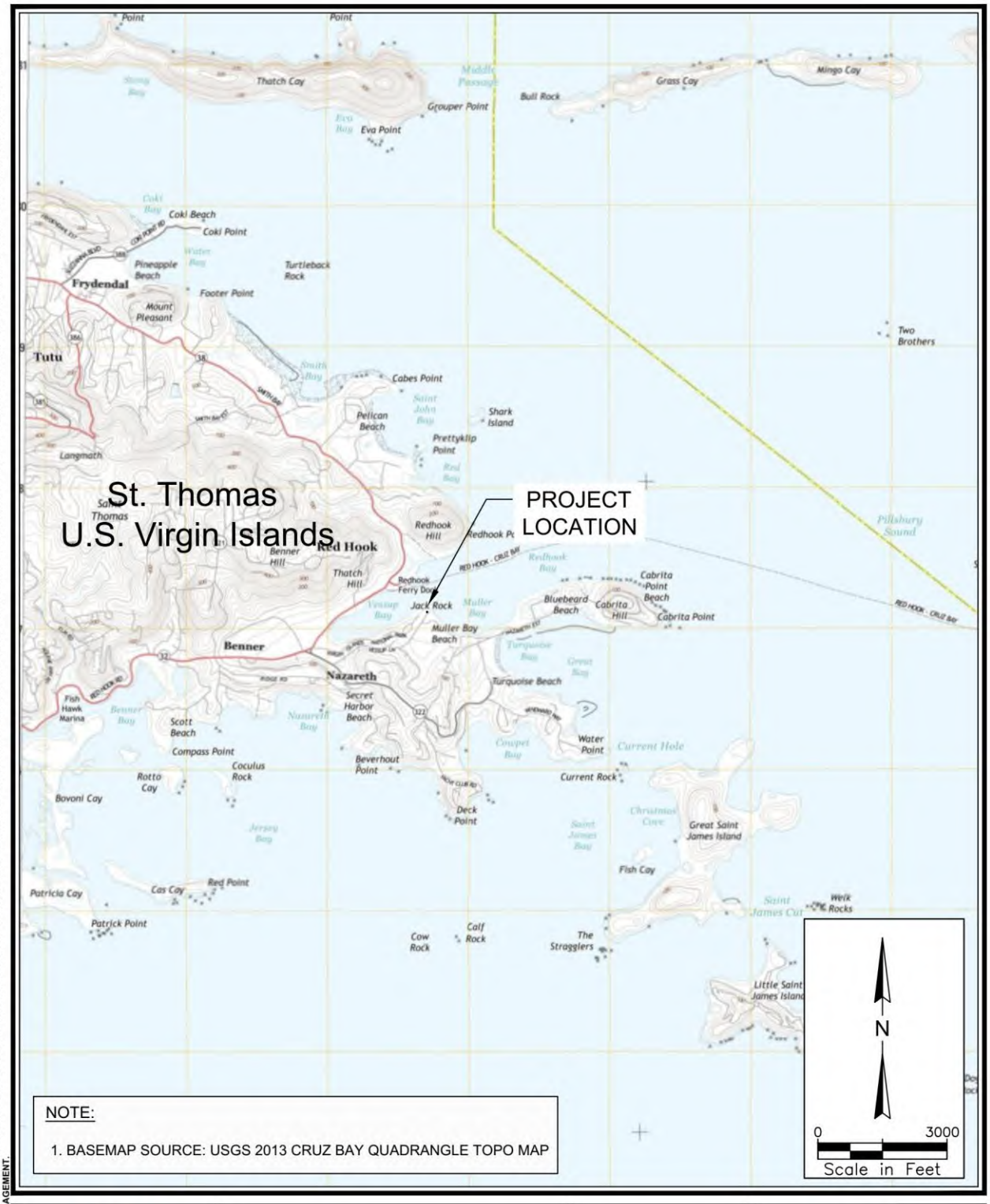
Checker
Project Architect

2021002
Project No.

05.03.2021
Date

B-A231
Drawing No.

NOT ISSUED FOR CONSTRUCTION



NOTE:

1. BASEMAP SOURCE: USGS 2013 CRUZ BAY QUADRANGLE TOPO MAP

ATM
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2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

LOCATION PLAN

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

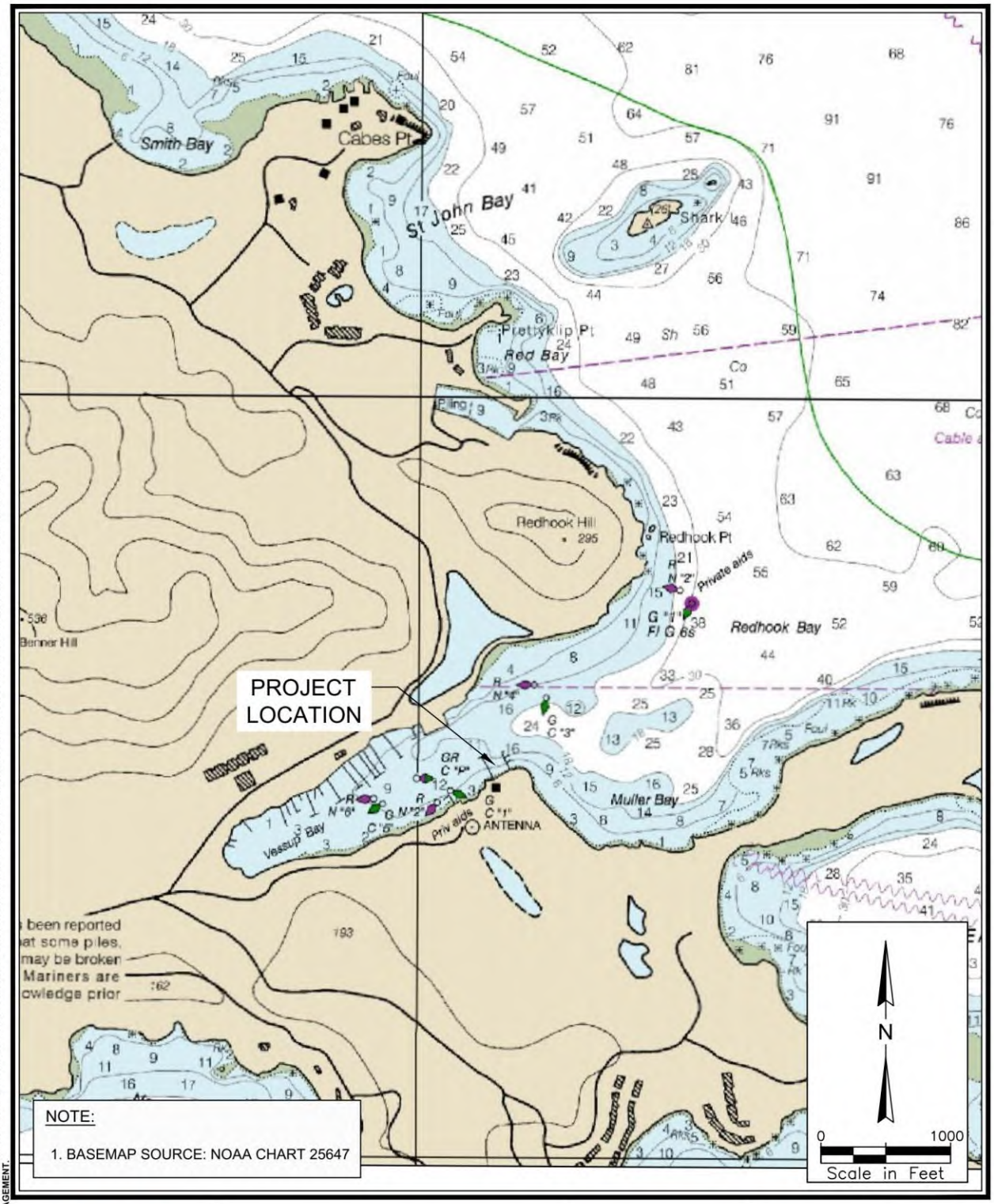
Sheet Number: 1 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



NOTE:

1. BASEMAP SOURCE: NOAA CHART 25647

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2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
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Certificate of Authorization #4669

NAVIGATION PLAN

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

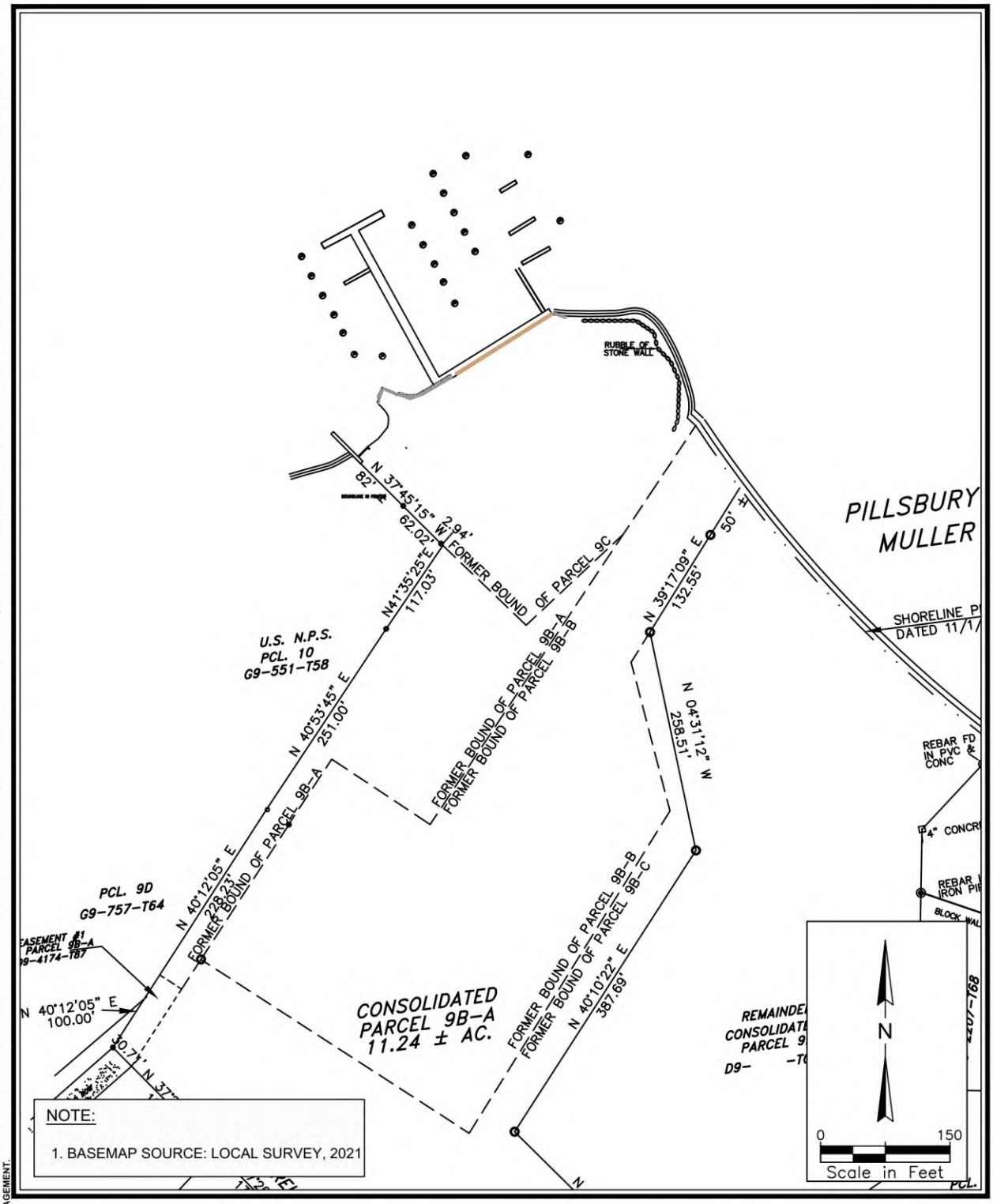
Sheet Number: 2 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



NOTE:

1. BASEMAP SOURCE: LOCAL SURVEY, 2021

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West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

PARCEL MAP

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

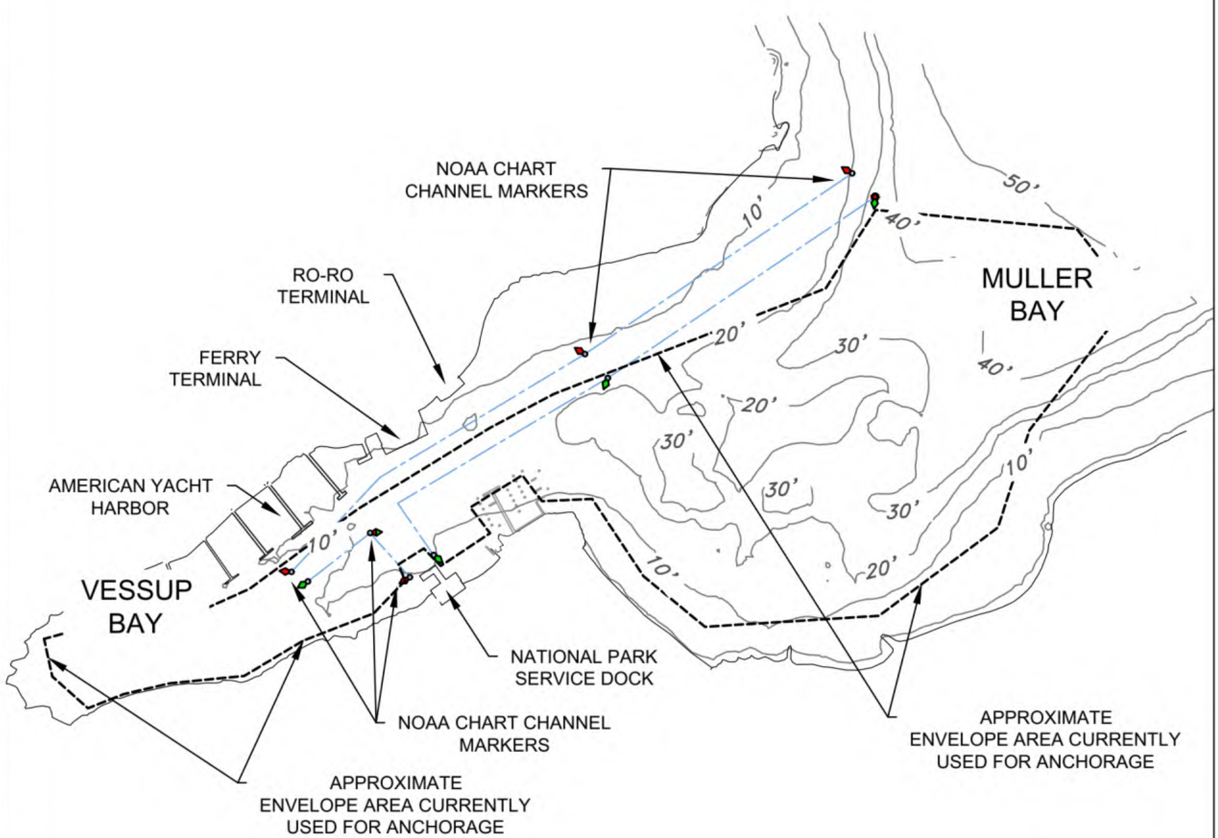
Sheet Number: 3 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

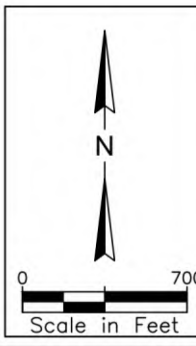
Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022

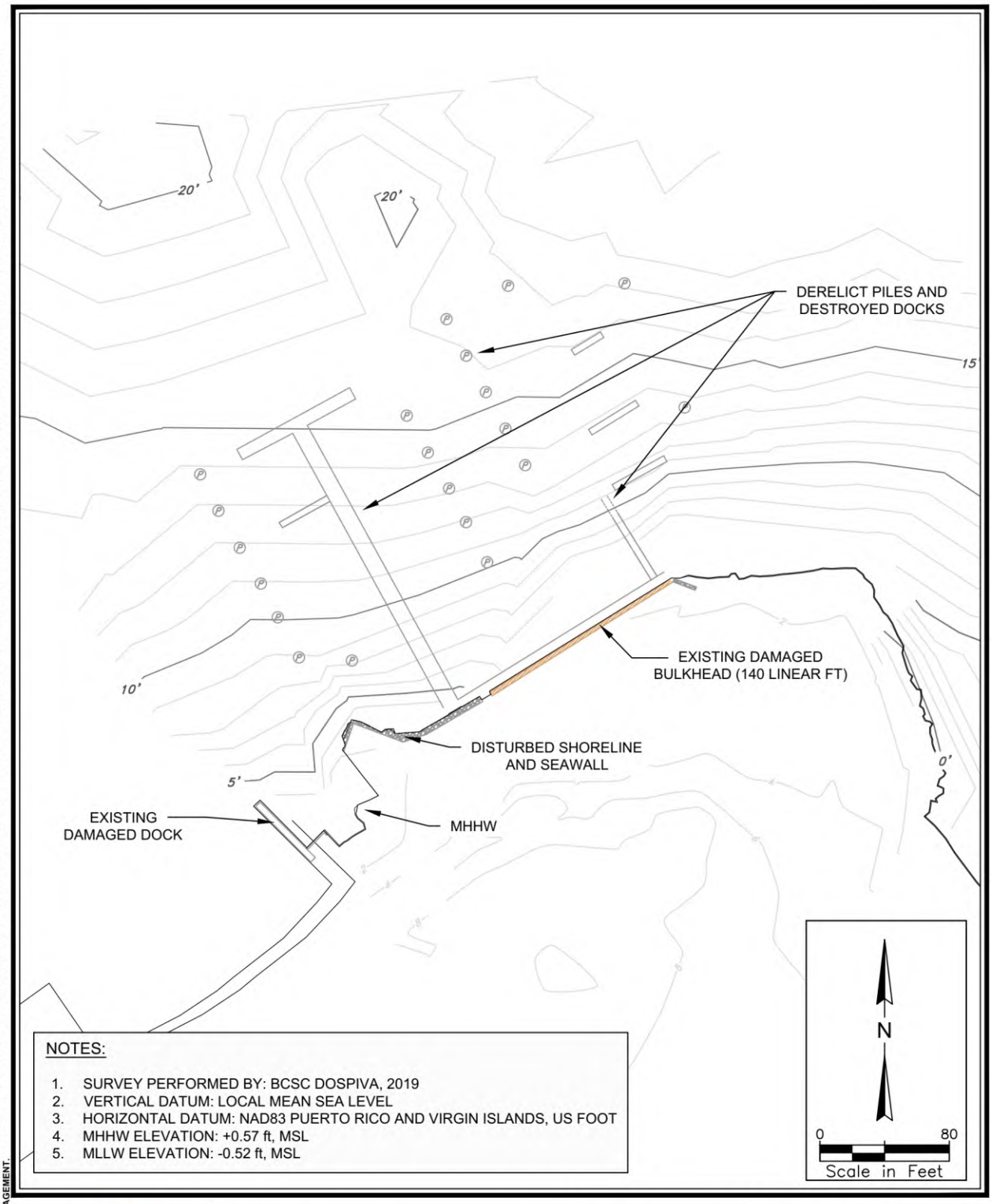


NOTES:

1. BARHYMETRY SOURCE: NOAA NATIONAL OCEAN SERVICE 2011 LiDAR
2. APPROXIMATE EXISTING ANCHORAGE BOUNDARIES BASED ON AERIALS IMAGERY.
3. VERTICAL DATUM: LOCAL MEAN LOWER LOW WATER
4. HORIZONTAL DATUM: NAD83 PUERTO RICO AND VIRGIN ISLANDS, US FOOT
5. MHHW ELEVATION: +0.57 ft, MSL
6. MLLW ELEVATION: -0.52 ft, MSL



ATM A Geosyntec Company 2047 Vista Parkway, Suite 201 West Palm Beach, FL 33411 (561) 659-0041 Certificate of Authorization #4669	EXISTING CONDITIONS VESSUP & MULLER BAY	Requested by: Jack Rock B-A, LLC Redhook Hayes B Rem, LLC	Location: Vessup Bay, St. Thomas , USVI Parcel ID: Waterbody: Muller Bay - Vessup Bay
	LATITUDE 18 MARINA	Sheet Number: 4 of 24 FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION	Latitude: 18 19' 32" N Longitude: 64 50' 54" W Issue Date: 12-19-2022



NOTES:

1. SURVEY PERFORMED BY: BCSC DOSPIVA, 2019
2. VERTICAL DATUM: LOCAL MEAN SEA LEVEL
3. HORIZONTAL DATUM: NAD83 PUERTO RICO AND VIRGIN ISLANDS, US FOOT
4. MHHW ELEVATION: +0.57 ft, MSL
5. MLLW ELEVATION: -0.52 ft, MSL

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SITE EXISTING CONDITIONS

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

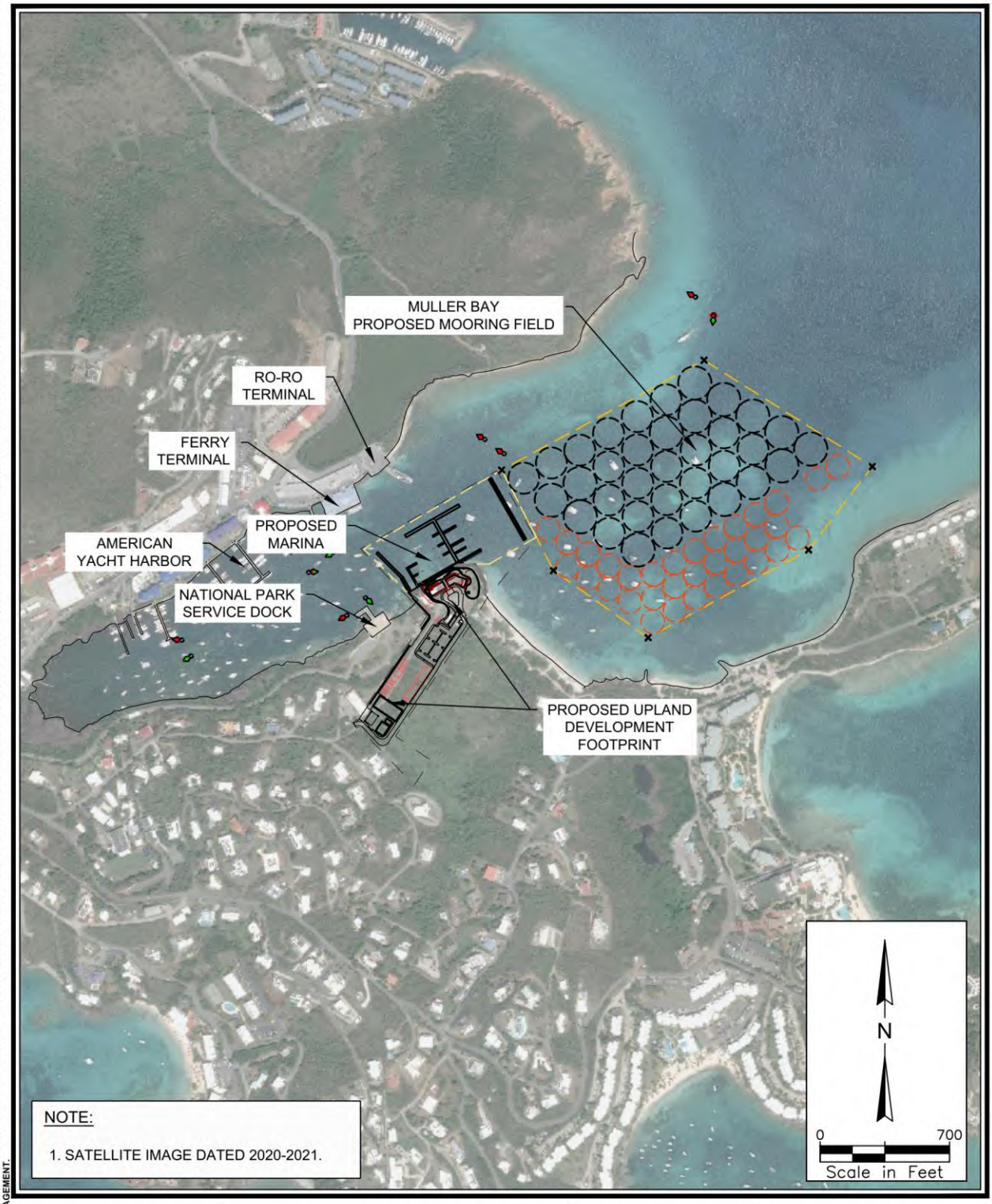
Sheet Number: 5 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



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PROJECT COMPONENTS

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

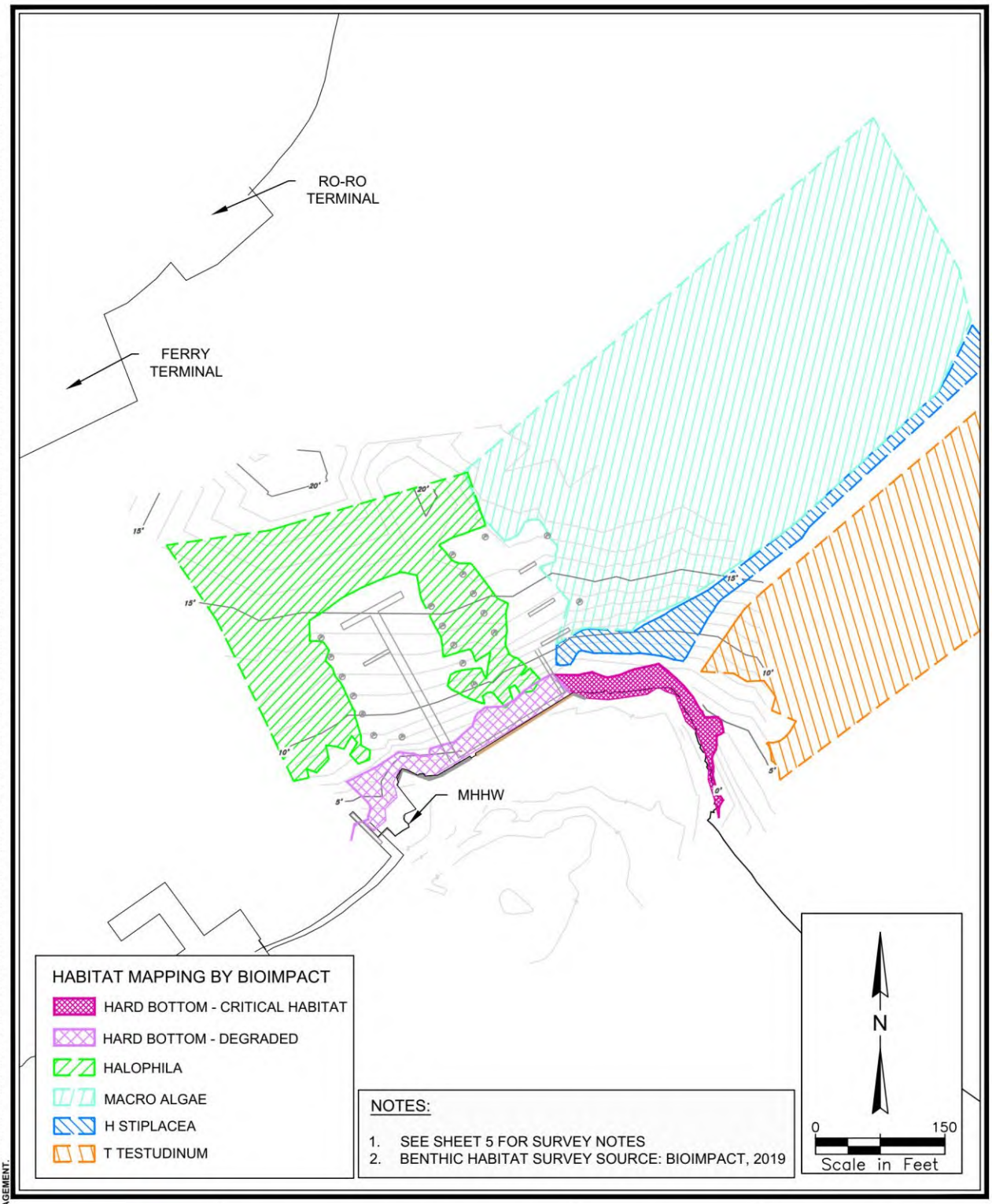
Sheet Number: 6 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



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EXISTING BENTHIC HABITAT
MARINA SITE

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

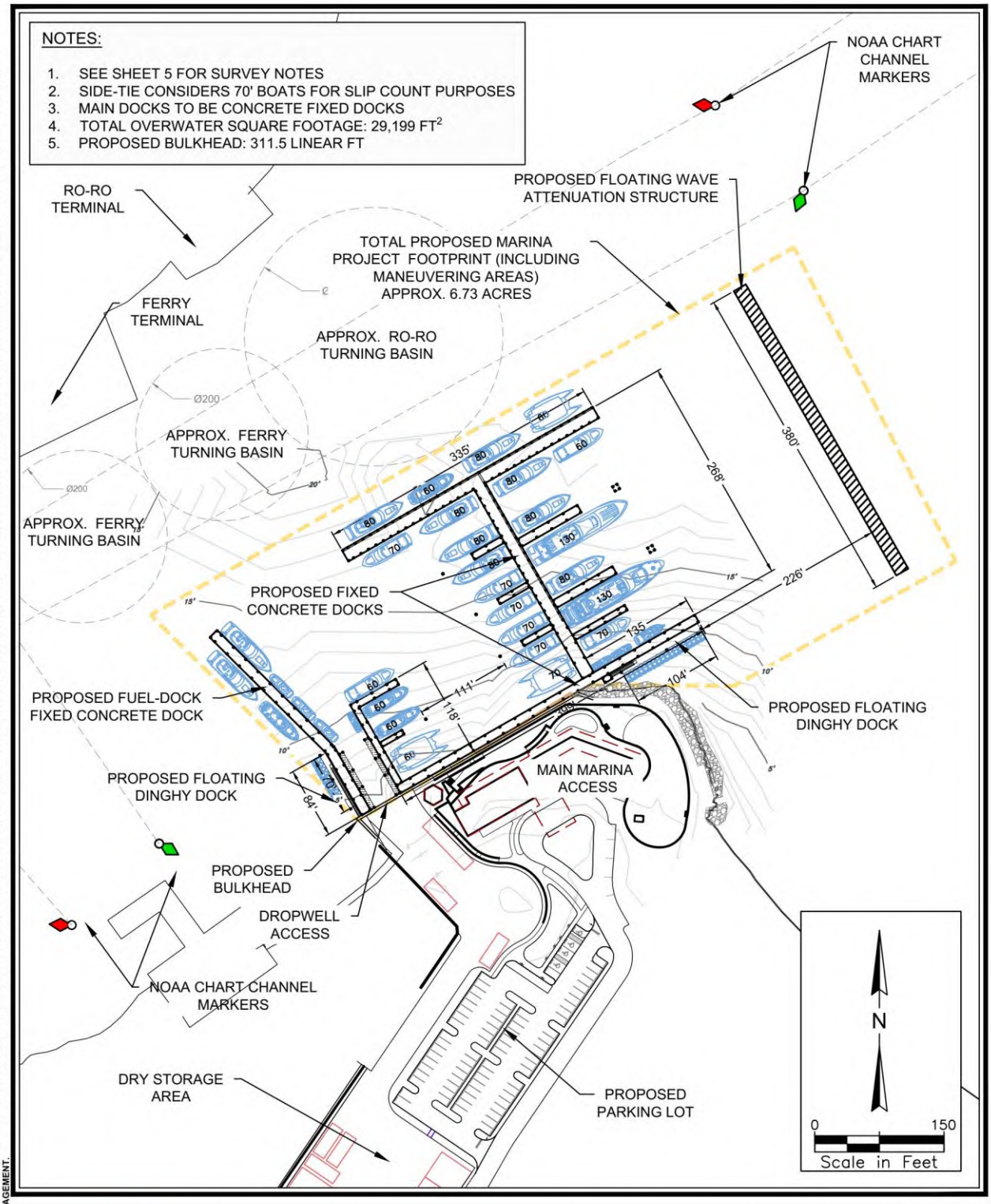
Sheet Number: 7 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



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West Palm Beach, FL 33411
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Certificate of Authorization #4669

OVERALL PROPOSED PLAN
MARINA

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

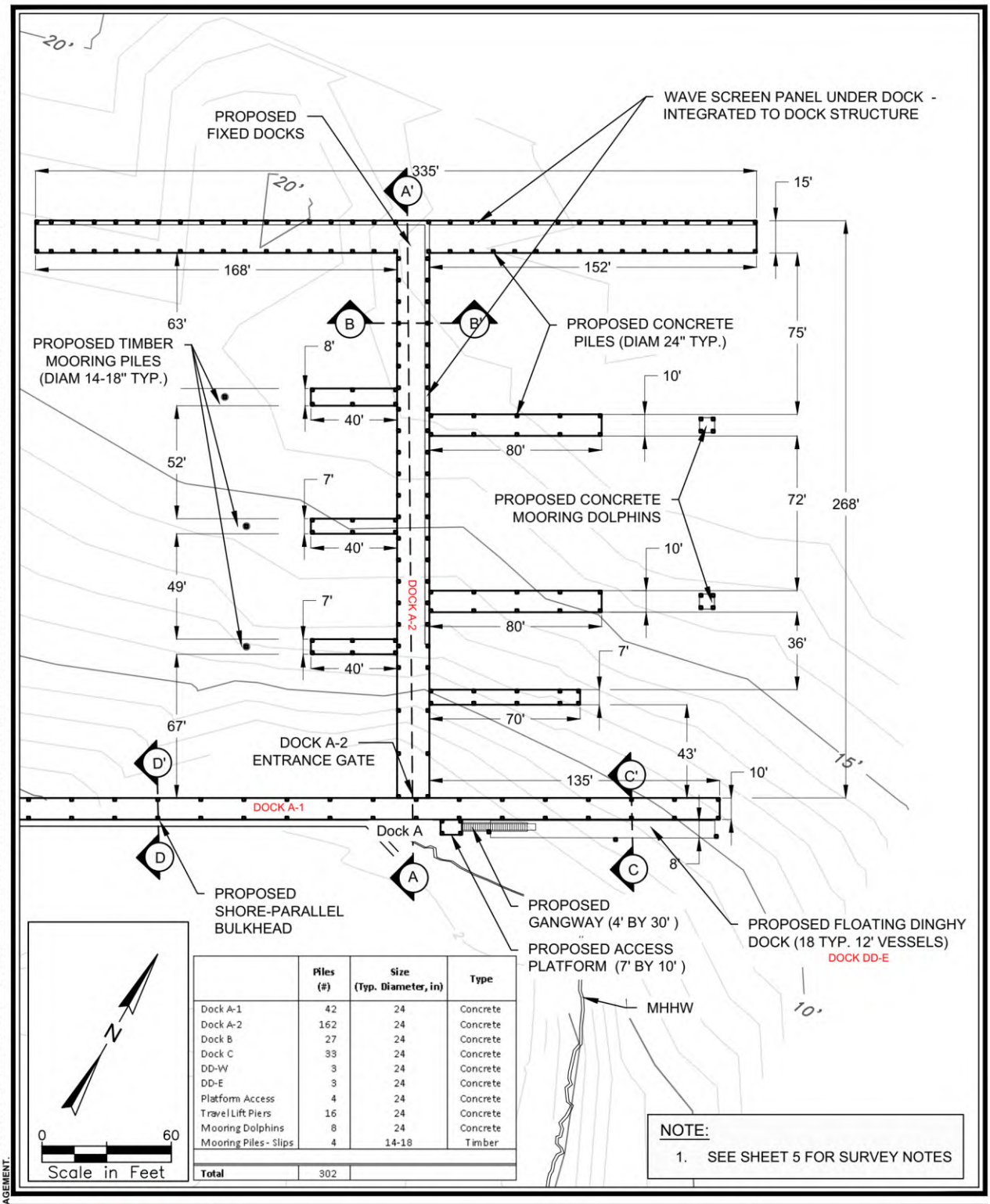
Sheet Number: 8 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



	Piles (#)	Size (Typ. Diameter, in)	Type
Dock A-1	42	24	Concrete
Dock A-2	162	24	Concrete
Dock B	27	24	Concrete
Dock C	33	24	Concrete
DD-W	3	24	Concrete
DD-E	3	24	Concrete
Platform Access	4	24	Concrete
Travel Lift Piers	16	24	Concrete
Mooring Dolphins	8	24	Concrete
Mooring Piles - Slips	4	14-18	Timber
Total	302		

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2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

PROPOSED DOCKS A PLAN

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

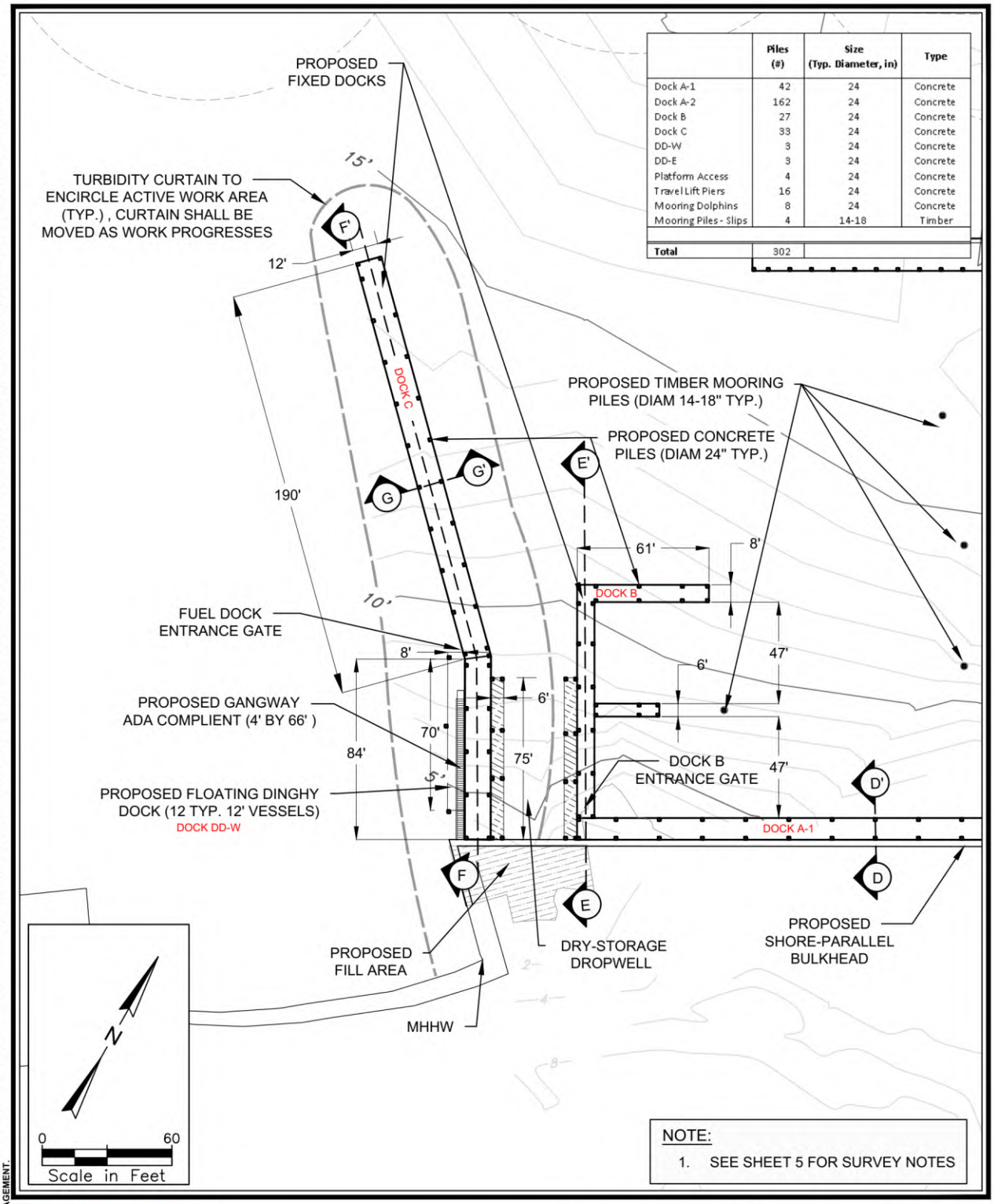
Sheet Number: 9 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



	Piles (#)	Size (Typ. Diameter, in)	Type
Dock A-1	42	24	Concrete
Dock A-2	162	24	Concrete
Dock B	27	24	Concrete
Dock C	33	24	Concrete
DD-W	3	24	Concrete
DD-E	3	24	Concrete
Platform Access	4	24	Concrete
Travel Lift Piers	16	24	Concrete
Mooring Dolphins	8	24	Concrete
Mooring Piles - Slips	4	14-18	Timber
Total	302		

NOTE:
1. SEE SHEET 5 FOR SURVEY NOTES

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West Palm Beach, FL 33411
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Certificate of Authorization #4669

PROPOSED DOCK B & C

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

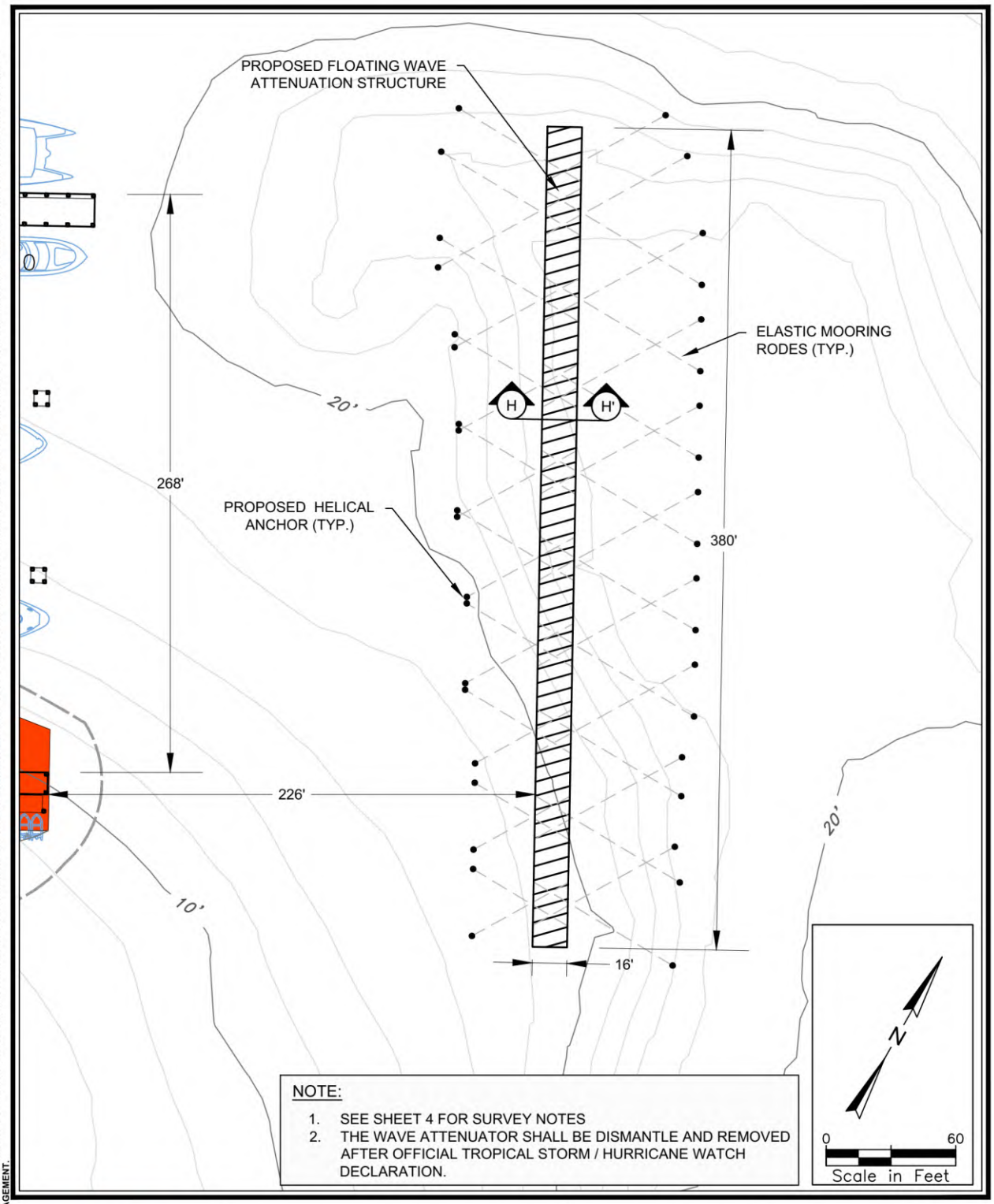
Sheet Number: 10 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



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West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

PROPOSED WAVE ATTENUATOR

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

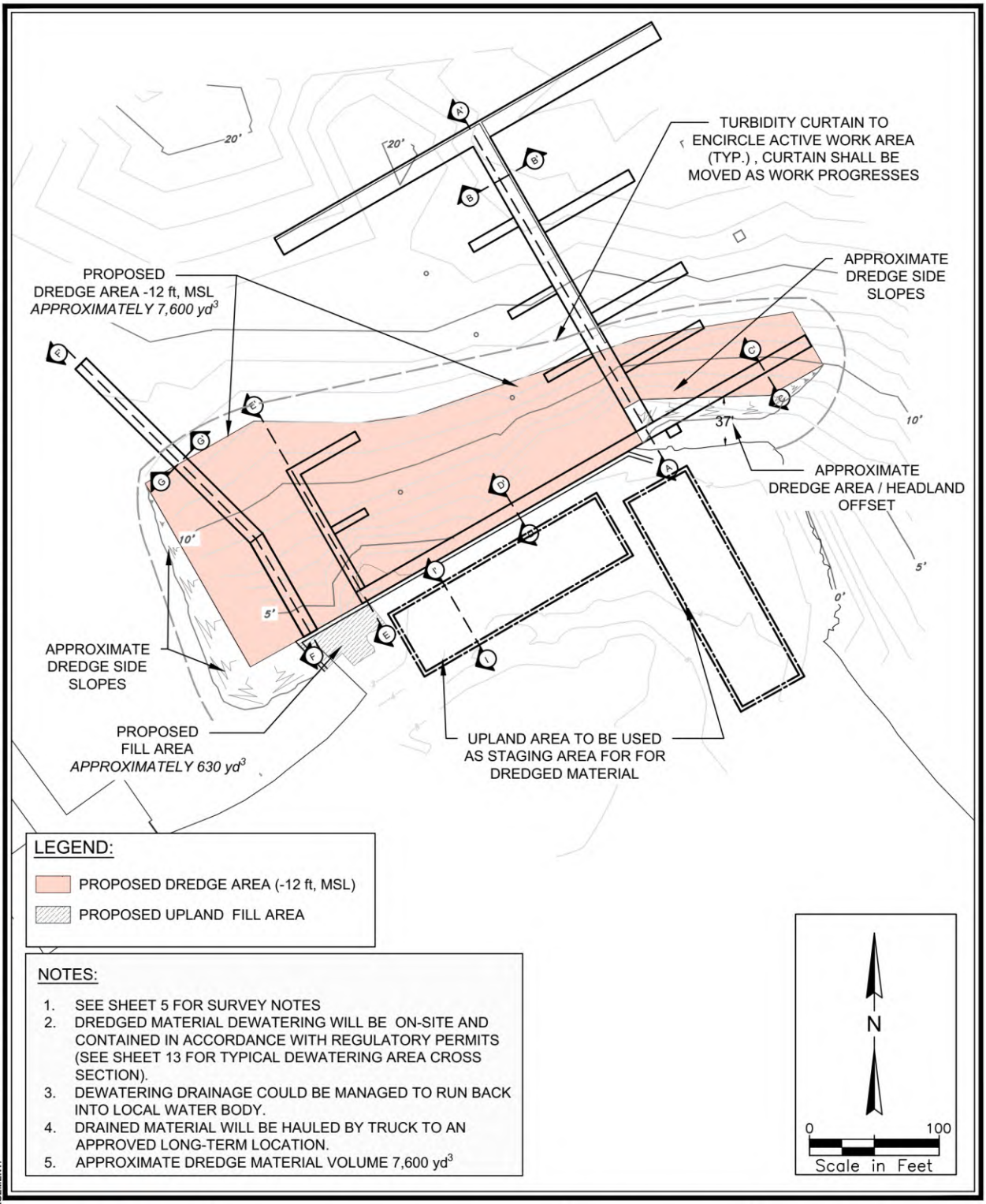
Sheet Number: 11 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



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2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

OVERALL PROPOSED DREDGING PLAN

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 12 of 24

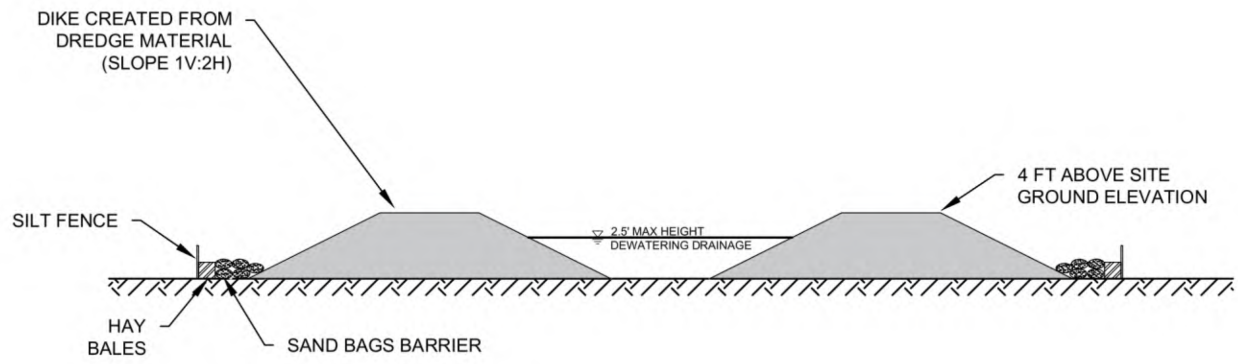
FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022

DIEGO.DELGADOTAMARLOCATION G:\WESTPALMBEACH SHARES\DRAWINGS\PROJECTS\19-3374 VI VESSUP POINT MARINA FEASIBILITY NDA\X\PERMIT\VESSUP_ATMSUPPORT_AUG2022\ATM_LATITUDEMARINA_PERMITSET_16DEC22.DWG



TYPICAL CONTAINMENT AREA
SECTION I-I' 1"=10'

ATM
A Geosyntec Company
2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

SECTION I
TYPICAL CONTAINMENT AREA

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 13 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022

ATM
A Geosyntec Company
2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

LATITUDE 18 MARINA

SECTION A & B

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

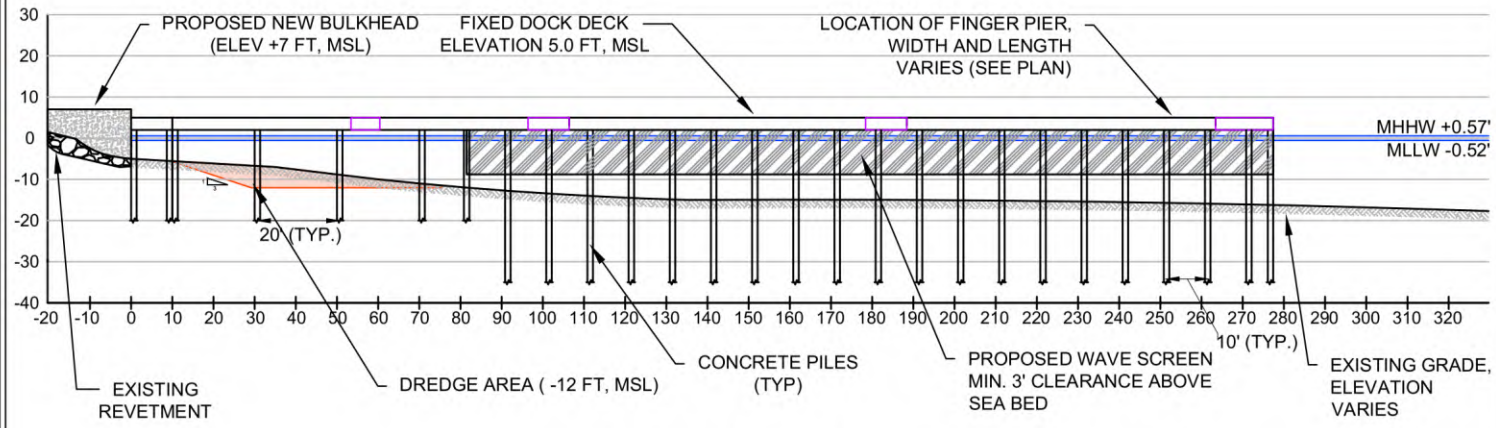
Sheet Number: 14 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

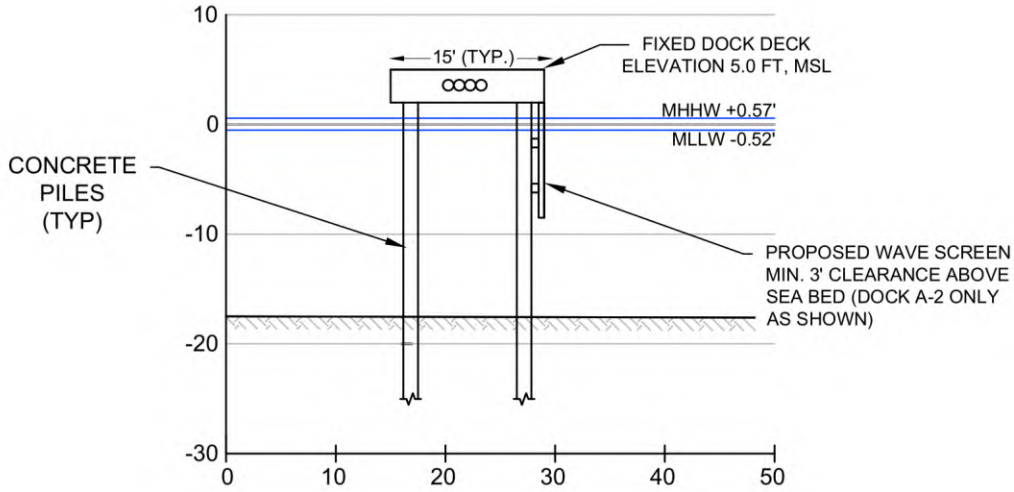
Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



FIXED DOCK A-2
SECTION A-A' 1"=40'



DOCK SECTION (TYPICAL)
SECTION B-B' 1"=15'

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A Geomatrix Company
2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

SECTION C & D

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

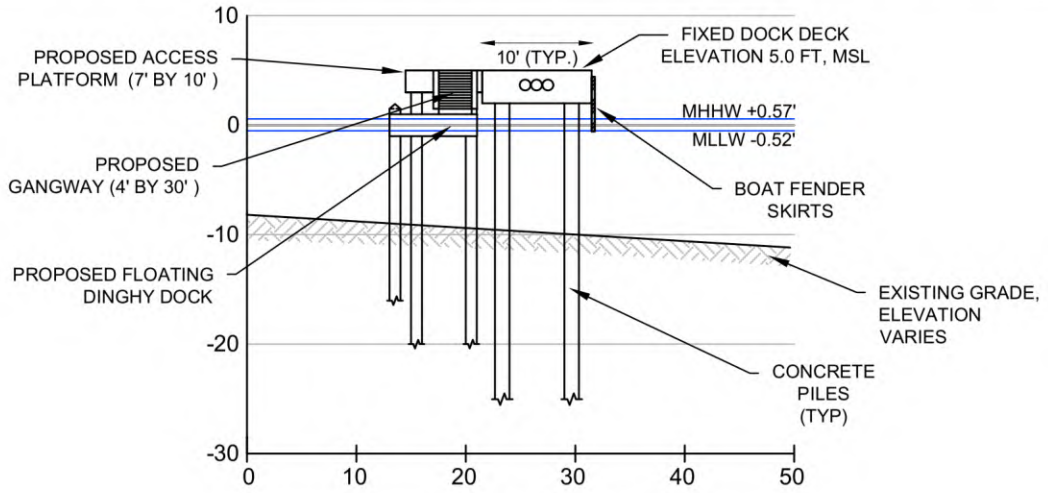
Sheet Number: 15 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

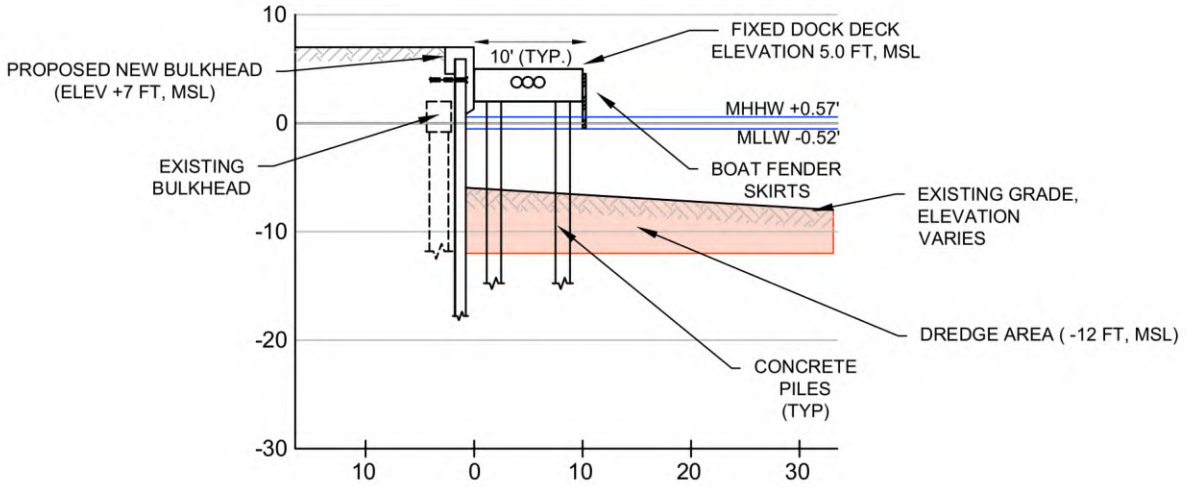
Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022

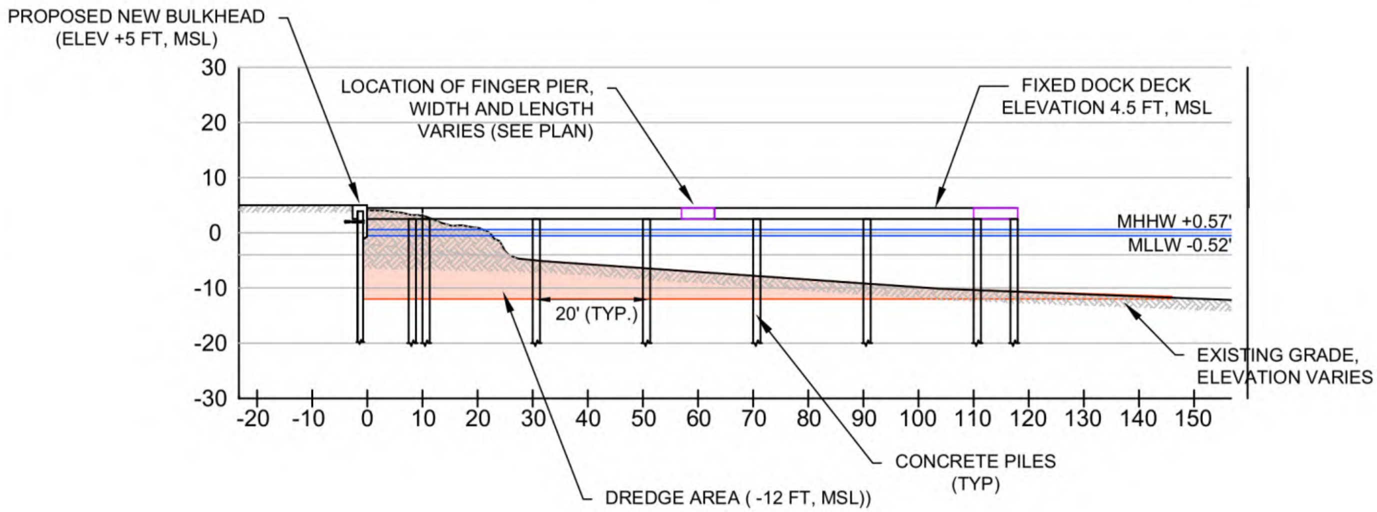


FIXED DOCK A-1
SECTION C-C' 1"=15'



FIXED DOCK A-1
SECTION D-D' 1"=15'

NOTE: THESE DRAWINGS AND DESIGNS ARE STRICTLY CONFIDENTIAL AND PROTECTED BY INTERNATIONAL COPYRIGHT LAW. DETAILS MUST NOT BE DISCLOSED, REPRODUCED OR COMMUNICATED TO A 3rd PARTY IN ANY FORM OR MANNER WITHOUT THE PRIOR WRITTEN APPROVAL OF APPLIED TECHNOLOGY & MANAGEMENT.



FIXED DOCK B

SECTION E-E' 1"=30'

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2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

SECTION E

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 16 of 24

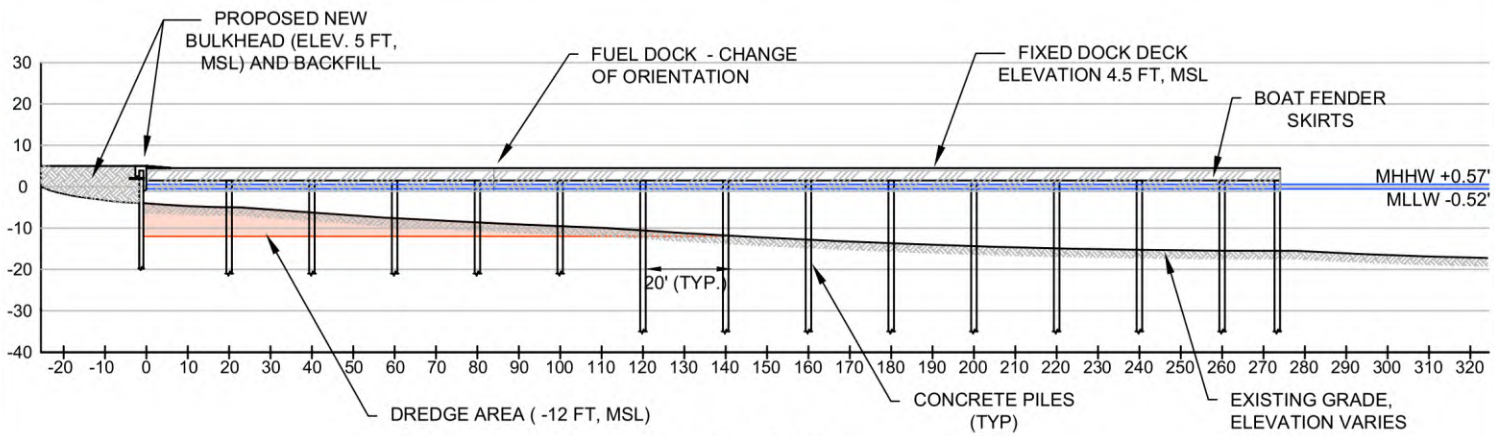
FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

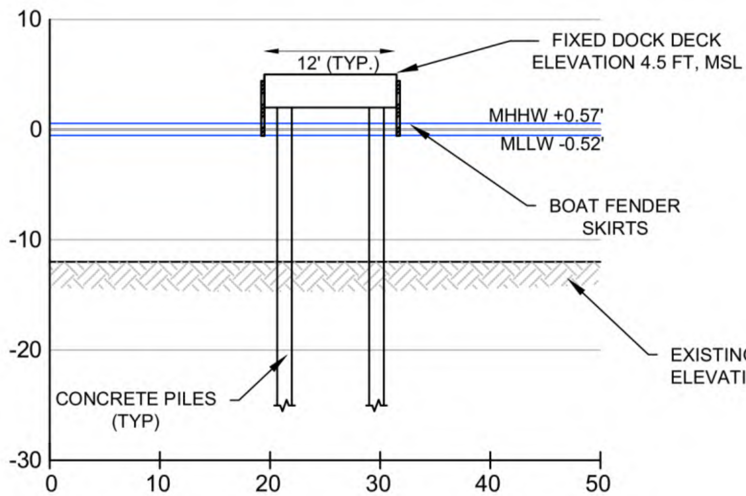
Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022

DIEGO.DELGADOTAMARIZ LOCATION: G:\WESTPALMBEACH SHARES\DRAWINGS\PROJECTS\19-3374 VI VESSUP POINT MARINA FEASIBILITY NDA\X\PERMIT\VESSUP_ATMSUPPORT_AUG2022\ATM_LATITUDEMARINA_PERMITSET_16DEC22.DWG



FIXED DOCK C
SECTION F-F' 1"=40'



FIXED DOCK C
SECTION G-G' 1"=15'

ATM
A Geosyntec Company
2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411
(561) 659-0041
Certificate of Authorization #4669

SECTION F & G

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

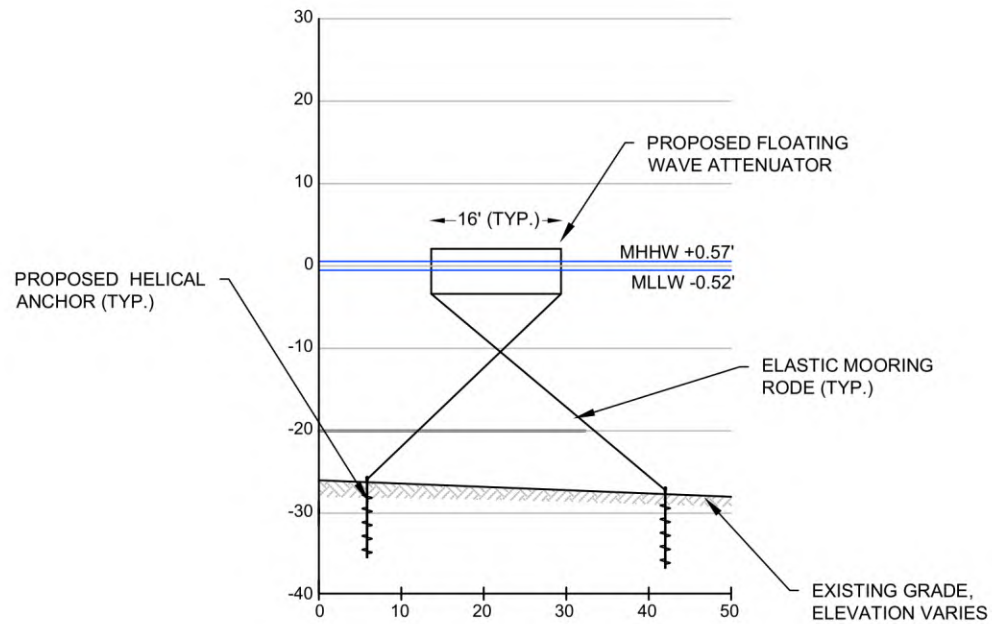
Sheet Number: 17 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W

Issue Date: 12-19-2022



WAVE ATTENUATOR
SECTION H-H' 1"=20'

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West Palm Beach, FL 33411
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Certificate of Authorization #4669

SECTION H
WAVE ATTENUATOR

LATITUDE 18 MARINA

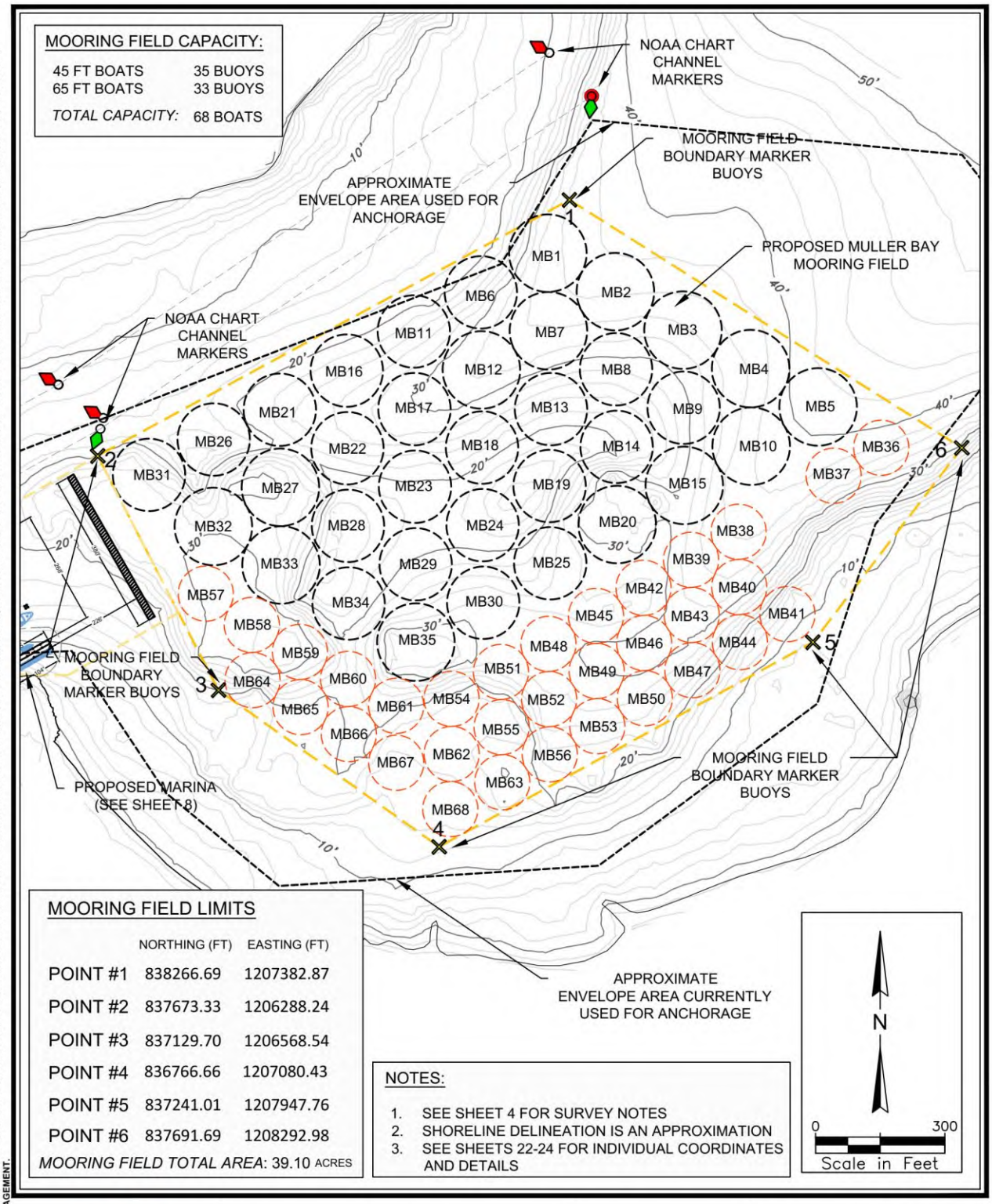
Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 18 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
Waterbody: Muller Bay - Vessup Bay

Latitude: 18 19' 32" N
Longitude: 64 50' 54" W
Issue Date: 12-19-2022



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OVERALL PROPOSED PLAN
MULLER BAY MOORING FIELD

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 20 of 24

FOR PERMITTING PURPOSES ONLY
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Location: Vessup Bay, St. Thomas , USVI
Parcel ID:
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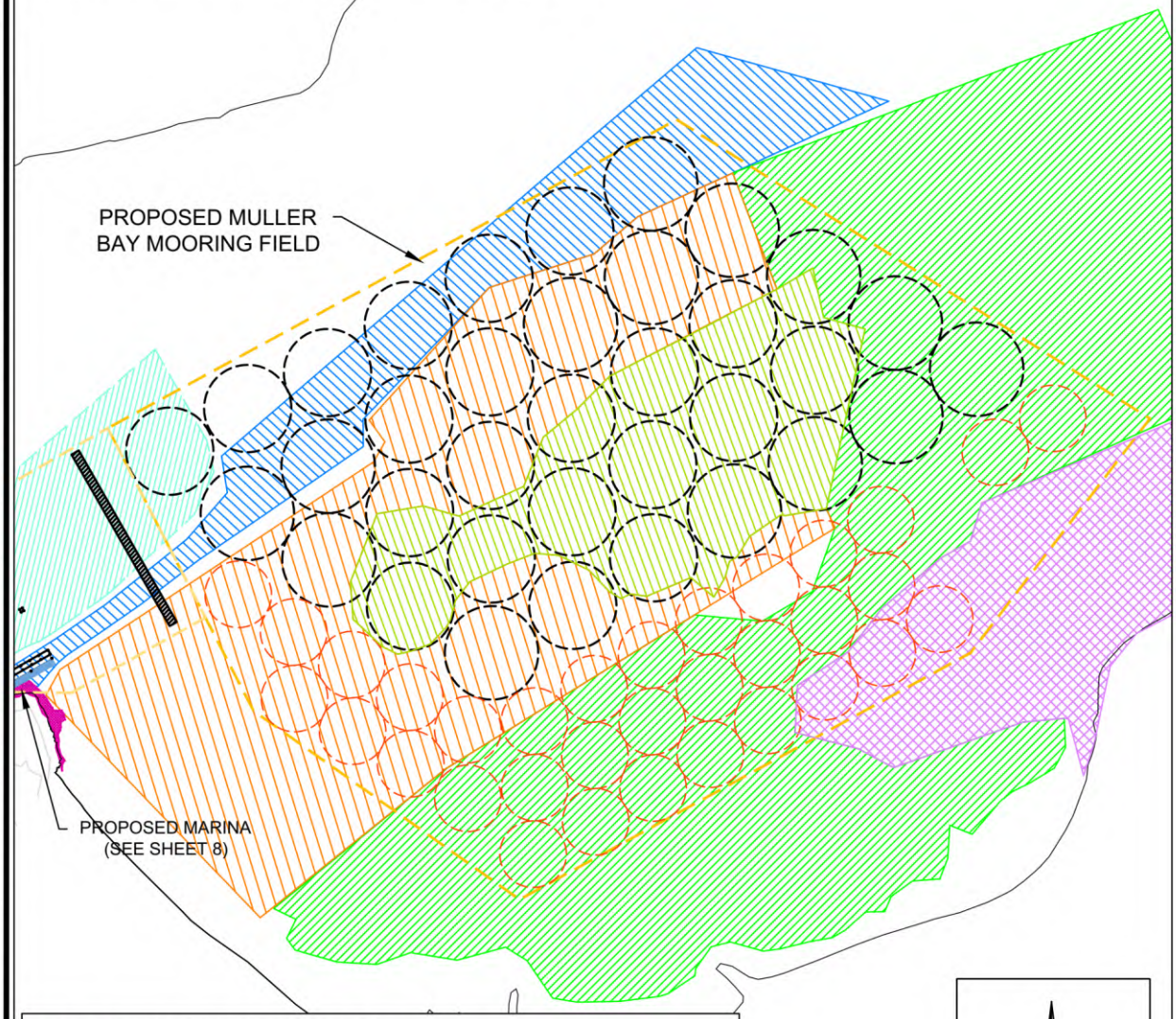
Issue Date: 12-19-2022

NOTE:

1. BENTHIC HABITAT SURVEY SOURCE: BIOIMPACT, 2021



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EXISTING BENTHIC HABITAT
MULLER BAY MOORING FIELD

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 21 of 24

FOR PERMITTING PURPOSES ONLY
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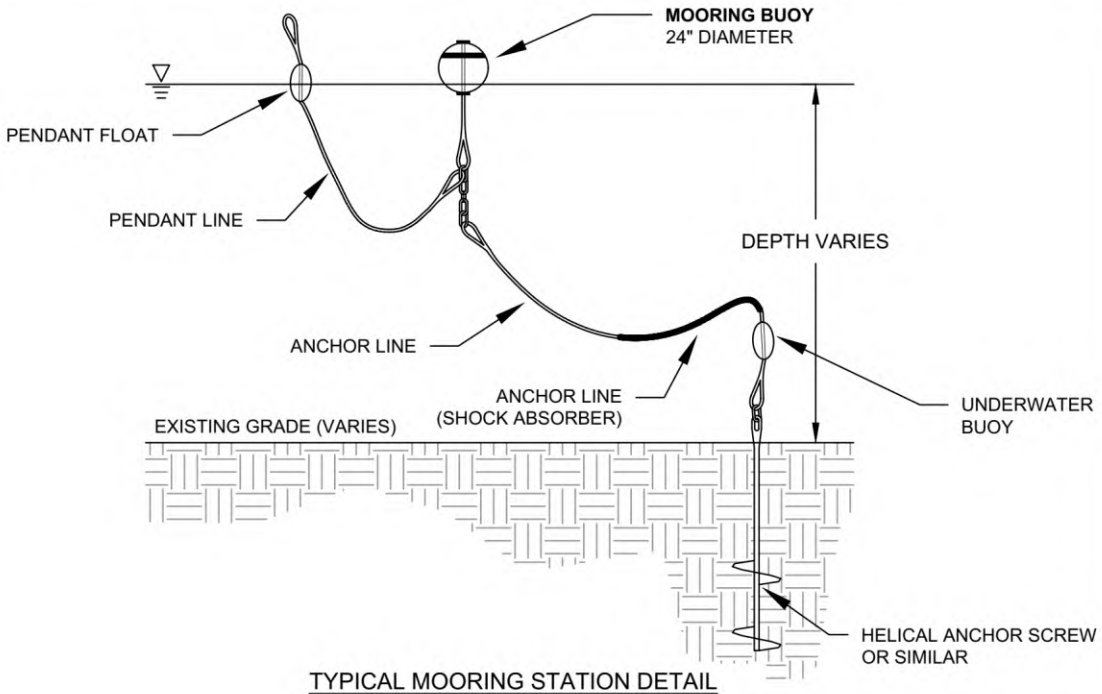
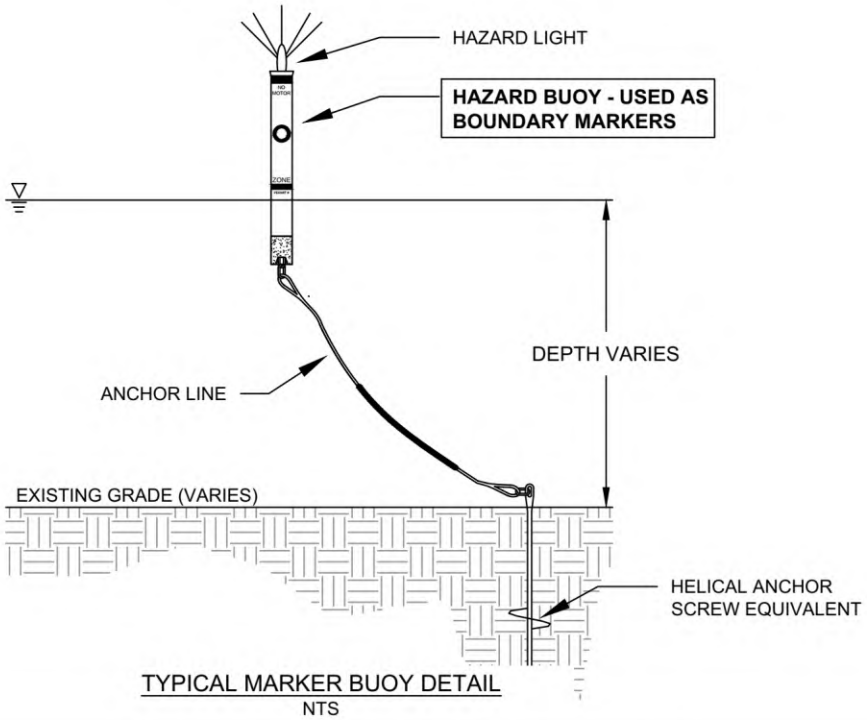


TYPICAL MOORING STATION DETAIL
NTS



TYPICAL MARKER BUOY DETAIL
NTS

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MOORING FIELD
TYPICAL ANCHOR DETAILS

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 22 of 24

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Location: Vessup Bay, St. Thomas , USVI
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Latitude: 18 19' 32" N
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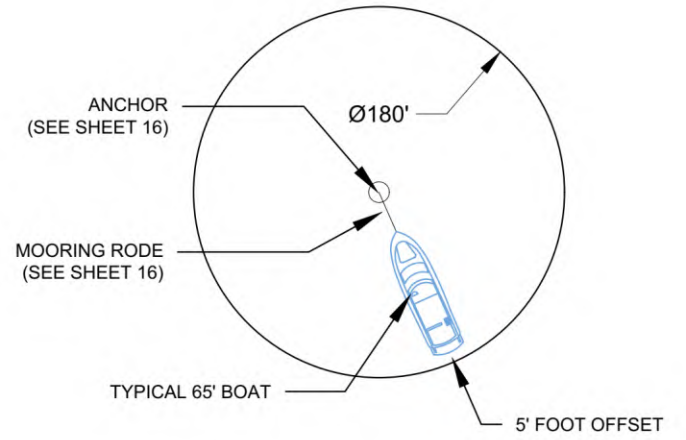
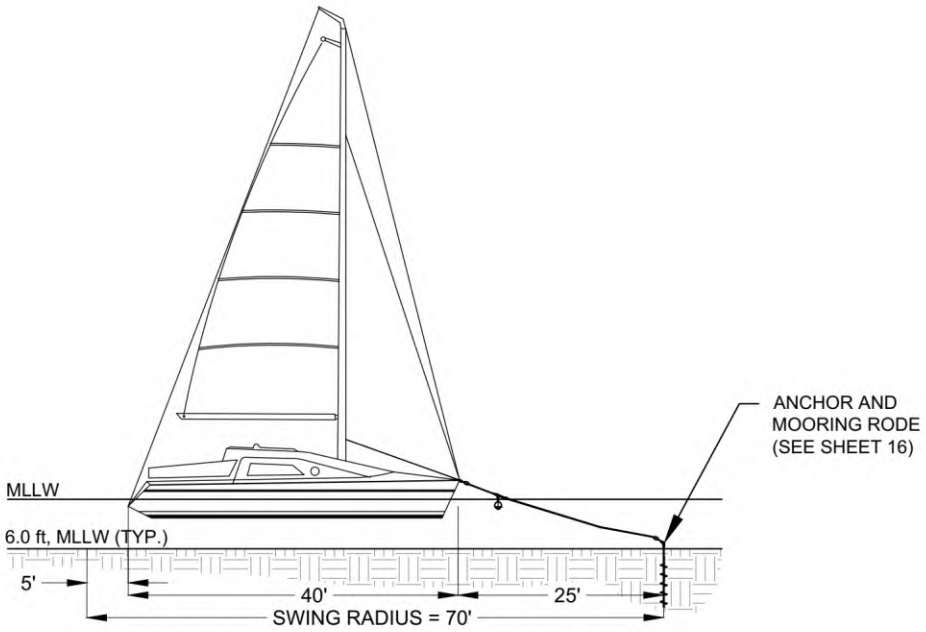
TYPICAL MOORING FIELD STATION
MULLER BAY (MB1 THRU MB68)





TYPICAL VESSEL AT MOORING FIELD
VESSUP BAY 1"=20'

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MOORING FIELD
ADDITIONAL ANCHOR DETAILS

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 23 of 24

FOR PERMITTING PURPOSES ONLY
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Location: Vessup Bay, St. Thomas , USVI
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MULLER BAY MOORING FIELD (65 ft VESSELS)			
BUOY	NORTHING (FT)	EASTING (FT)	SWING RADIUS (FT)
MB1	838143.1487	1207332.639	90
MB2	838053.9131	1207489.47	90
MB3	837964.6779	1207646.30	90
MB4	837875.4425	1207803.131	90
MB5	837786.6332	1207959.711	90
MB6	838052.3894	1207177.196	84
MB7	837963.1538	1207334.026	90
MB8	837873.9186	1207490.856	84
MB9	837784.6832	1207647.687	84
MB10	837695.6166	1207804.418	90
MB11	837961.6302	1207021.752	84
MB12	837872.3948	1207178.582	90
MB13	837781.8624	1207338.249	84
MB14	837693.924	1207492.243	84
MB15	837604.600	1207649.125	90
MB16	837870.8709	1206866.308	84
MB17	837781.6355	1207023.139	84
MB18	837692.4001	1207179.969	84
MB19	837603.1647	1207336.799	84
MB20	837513.9293	1207493.63	84
MB21	837780.1117	1206710.864	84
MB22	837690.8763	1206867.695	84
MB23	837601.6409	1207024.525	84
MB24	837512.4055	1207181.356	84
MB25	837424.052	1207338.179	84
MB26	837711.110	1206557.410	84
MB27	837600.117	1206712.251	84
MB28	837510.8816	1206869.081	84
MB29	837421.6462	1207025.912	90
MB30	837332.4108	1207182.742	84
MB31	837629.080	1206407.400	84
MB32	837509.3578	1206556.807	84
MB33	837420.1224	1206713.638	84
MB34	837330.887	1206870.468	84
MB35	837241.2069	1207026.537	84

MULLER BAY MOORING FIELD (45 ft VESSELS)			
BUOY	NORTHING (FT)	EASTING (FT)	SWING RADIUS (FT)
MB36	837692.002	1208106.121	64
MB37	837627.0191	1207995.843	64
MB38	837497.0531	1207775.288	64
MB39	837432.0701	1207665.01	64
MB40	837369.0619	1207776.787	64
MB41	837306.0539	1207888.565	64
MB42	837367.0871	1207554.732	64
MB43	837304.0789	1207666.509	64
MB44	837241.0707	1207778.287	64
MB45	837302.1042	1207444.454	64
MB46	837239.0959	1207556.232	64
MB47	837176.0877	1207668.009	64
MB48	837237.1212	1207334.176	64
MB49	837174.1129	1207445.954	64
MB50	837111.1047	1207557.731	64
MB51	837172.1382	1207223.898	64
MB52	837109.13	1207335.676	64
MB53	837046.1217	1207447.453	64
MB54	837109.8621	1207109.323	64
MB55	837044.147	1207225.398	64
MB56	836981.1388	1207337.176	64
MB57	837353.6101	1206539.26	64
MB58	837281.0976	1206645.908	64
MB59	837218.5232	1206757.57	64
MB60	837155.9488	1206869.233	64
MB61	837093.3745	1206980.895	64
MB62	836981.9085	1207109.572	64
MB63	836916.1558	1207226.898	64
MB64	837153.0767	1206647.567	64
MB65	837090.5024	1206759.229	64
MB66	837027.928	1206870.891	64
MB67	836961.3783	1206981.043	64
MB68	836853.9483	1207106.381	64

NOTES:

1. SWING RADIUS VALUES TAKE WATER DEPTH INTO ACCOUNT

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MOORING FIELD
BUOYS COORDINATES

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 24 of 24

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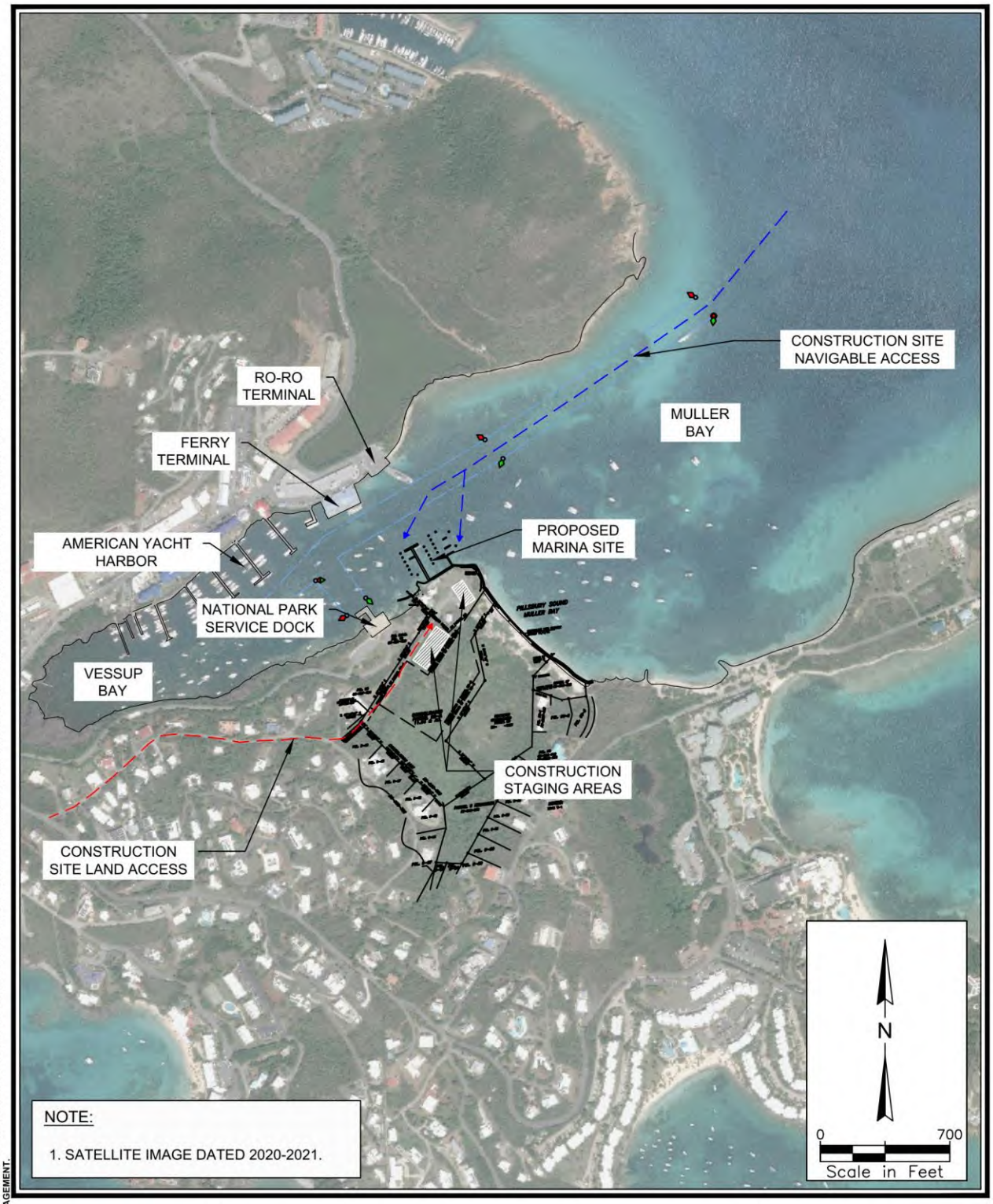

NOTE:

1. SATELLITE IMAGE DATED 2020-2021.

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CONSTRUCTION ACCESS & STAGING AREAS

LATITUDE 18 MARINA

Requested by:
Jack Rock B-A, LLC
Redhook Hayes B Rem, LLC

Sheet Number: 25 of 25

FOR PERMITTING PURPOSES ONLY
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Location: Vessup Bay, St. Thomas , USVI
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6.02 **Landforms, Geology, Soils, and Historic Use**

GEOLOGY OF ST. THOMAS, ST JOHN AND SURROUNDING CAYS

The Virgin Islands are near the northeastern corner of the present Caribbean Plate, a relatively small trapezoidal-shaped plate that is moving eastward relative to the North and South American continents carried on the American plate. The arc of the Lesser Antilles is an active volcanic arc above a subduction zone in which the Atlantic oceanic crust of the American Plate is carried downward under the Caribbean Plate. The closest volcano to the Virgin Islands that is still active is Saba, about 160 km. to the east. St. John is 7 miles long and 3 miles wide for a total of 12,000 acres or 19 square miles. The oldest rocks of St. John are submarine lavas (keratophyre and spilite), beds of volcanic debris and chert. Associated intrusive rocks of the Water Island Formation is overlain by andesitic volcanic and volcanoclastic rocks of the Louisenhoj Formation which underlies the island of St. Thomas to the east and much of the northwestern portion of St. John. Donnelly (1966) suggested that the Louisenhoj Formation was deposited unconformably on the Water Island Formation after a period of emergence, tilting and erosion, on the slopes and environs of a subaerial volcanic island located roughly between St. Thomas and St. John, an area now occupied by Pillsbury Sound. The youngest layered deposits on St. Thomas are volcaniclastic rocks of the Tutu Formation. Fossils contained in the Tutu Formation suggest that those deposits are of the Early Cretaceous (Albain) Age (Donnelly et. al. 1971). It appears that all the volcaniclastic rocks of St. Thomas and St. John were deposited in a relatively short period of time spanning 10 to 15 million years approximately 100 million years ago (D. Rankin 1988).

GEOLOGY OF THE LATITUDE 18 SITE

The project site sits between Vessup Bay, Mueller Bay and Red Hook Bay. The northwestern shore of the property faces Vessup Bay a narrow embayment which has poor water quality. The bay then widens, and the subject property has an eastern shoreline which faces Mueller Bay. Red Hook Bay is used to refer to the areas further seaward and often to refer to the enter bay which includes Vessup and Mueller Bay embayments.

The northern face of the property within Vessup Bay has been revetted with a rubble masonry wall and then stone riprap at “Jack Point” or “Jack Rock” wrapping around to the south into Mueller Bay. Mueller Bay has a sandy beach. Offshore in Vessup Bay the sediments area silty sand and in Mueller Bay there are coarser sands. Farther out within the area of the mooring field there are areas of emergent rock pavement.

Prior to 1960 there was a large salt pond to the southwest of the marina site which was filled with dredge material, the area still has piles of sand and there is still some piping associated with the dredging within the area. The soils throughout the filled area are sandy. The property reaches a maximum elevation of 10ft.


 White dredged sand is present throughout the filled area, some pushed up into large berms.

Figure 6.02.1 Orientation of the Latitude 18 property.

SOILS OF THE PROJECT SITE

The Custom Soil Survey of the Unites State Virgin Islands has classified 3 soil types on the Cabrita Property. **Salt flats ponded (SaA)** consist of area of unvegetated saline flats, saline marshes and salt ponds. The soils are very deep and poorly drained, strongly saline and frequently ponded for very long periods. This soil type encompasses where the old salt pond used to be in the center of the property. **Solitude gravelly fine sandy loan (SoA)**, is found in areas that are adjacent to saline marshes, flats and salt ponds and are a mixture of terrestrial and marine sediments. This soil type is found surrounding the area of the old salt pond and extends to the shoreline to the east. The final soil type is **Ustorthents (Us),** these soils are typically highly altered and have little vegetation and are excessively drained. These soils are found along the shoreline of the marina area and encompass a large portion of the property.

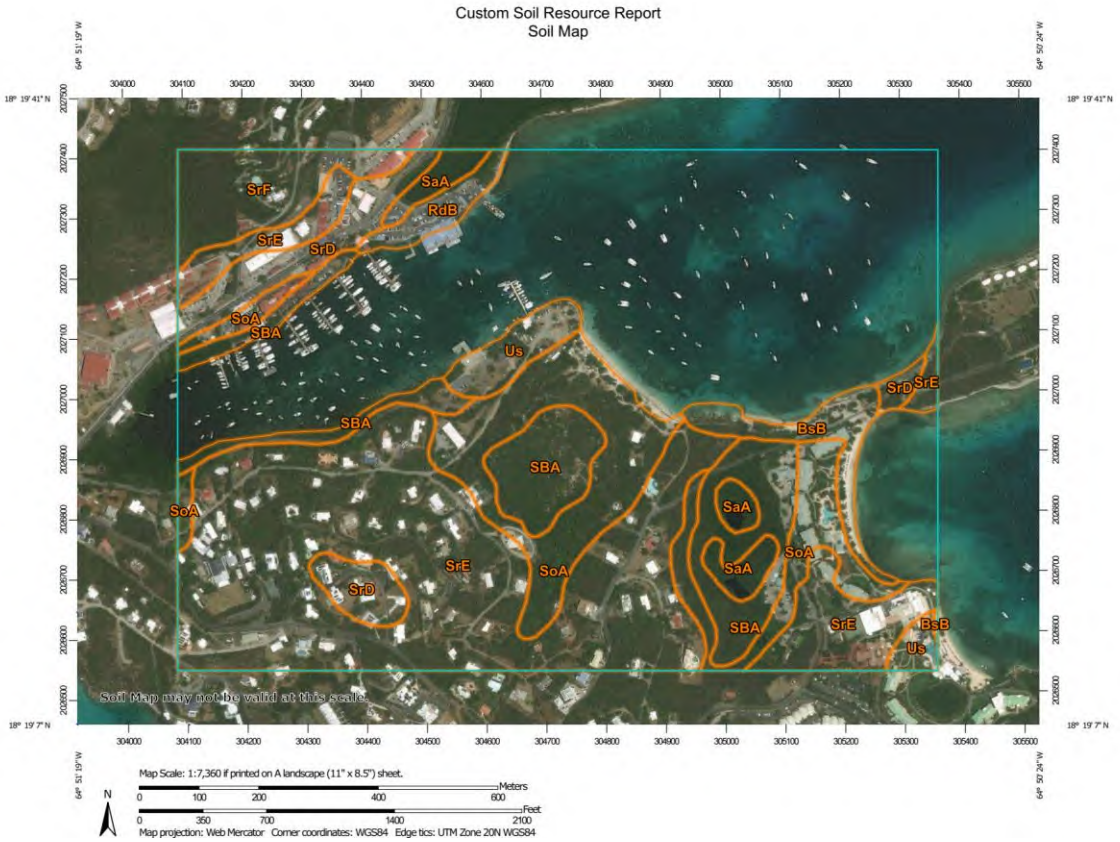


Figure 6.02.1 Custom Soils map of the project area (USGS Custom Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)

The bottom sediments of the bay consist of sand and gravel over hard rock. Coarse sand and shell fragments area commonly found in Muller Bay, while the inner reaches of Vessup Bay are silt and mud as a result of upland runoff.

Sediments were tested in 2006 during surveys for a previously proposed project. Cores were taken west of the existing dock and to the east of the existing docks. The samples were found to contain no fecal coliform bacteria or enterococci bacteria. The samples contained no mercury, silver, arsenic, beryllium, cadmium, lead, antimony, selenium, or thallium. The soils samples did not contain Diesel Range or Gasoline Range organics.

The samples contained chromium, nickel, and zinc. Sample 1 had 3.43 mg/kg chromium, 9.60 mg/kg nickel and 9.69 mg/kg zinc. Sample 2 contained 3.27 mg/kg chromium, 6.56 mg/kg nickel, and 3.93 mg/kg zinc. These concentrations are below regulatory target cleanup levels.

Compound	South Marina	North Marina	Florida CTLs	Florida CTLs	TCLP
	Sample 1	Sample 2	Residential	Industrial/Commercial	"Safe" Values
	ppm=mg/kg	ppm=mg/kg	mg/kg	mg/kg	Hazardous Waste ppm=mg/kg
Percent Solids	30.3506	30.5477			
Percent Moisture	26.2	27.7			
Fecal Coliform	0	0			
Enterococci	0	0			
Antimony	ND	ND	27	370	
Arsenic	ND	ND	2.1	12	
Beryllium	ND	ND	120	1400	
Cadmium	ND	ND	82	1700	
Chromium	3.27	3.43	210	470	100ppm
Copper	6.56	9.6	150	89000	
Lead	ND	ND	400	1400	
Nickel	ND	ND	340	35000	100ppm
Selenium	ND	ND	440	11000	
Silver	ND	ND	410	8200	100ppm
Thallium	ND	ND	6.1	150	
Zinc	3.93	5.69	26000	630000	
Mercury	ND	ND	3	17	
Diesel Range Organics	ND	ND			
Gasoline Range Organics	ND	ND			

Table 6.02.1 Results of 2006 sediment sampling

HISTORIC USE

Prior to any development the area had an expansive wetland and salt pond and there was a rocky promontory on the point which was once referred to as Jack Rock. The 1954 USGS aerial below shows the site prior to the filling of the wetland.

The 1954 aerial shows expansive wetlands at the site, at the Ritz Carlton site and a pond which covers the width of Cabrita Point.

By 1972 the wetland had been filled and there is a structure on the site. The area from which the sand was dredged is visible in the Bay.

By 1974 there was more development in the subject parcel.

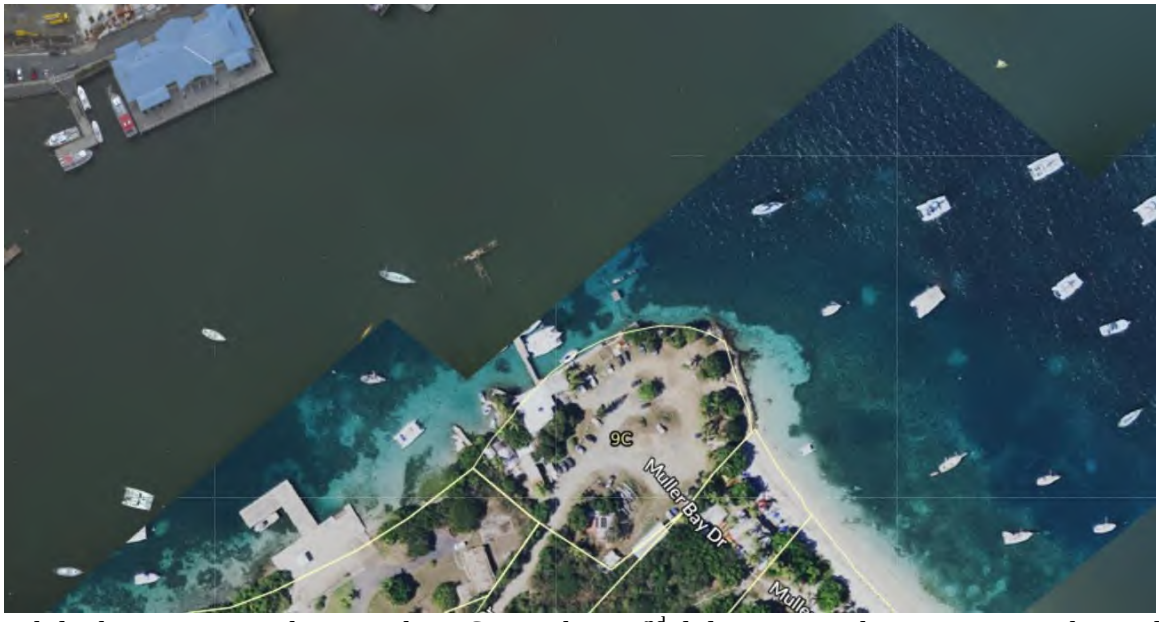
This infrared photograph firm 1984 shows there has still been limited activity on the property and the old wetland area is revegetating.

The docks would begin development in the mid 1980's and they were damaged by first hurricane Hugo in 1989 and then hurricane Marilyn in 1995.

This1999 shows that one dock was rebuilt, and the remnants of the more easterly dock are present. The easterly dock was destroyed by hurricane Marilyn.

The dock prior to the 2017 hurricanes,


Post Hurricane Irma on September 15th or 16th.



While this post Irma photograph on September 22nd did not cover the entire site it shows that the end of the dock was taken out by the second storm.

ADVERSE SITE CONDITIONS

There is always some risk of damage in a coastal facility. The 100-year storm condition is an arbitrary standard adopted in the US for coastal insurance purposes. It means that the event has a 1% chance of exceedance in any year and is based on historical records. Statistically, there is a 26% chance of a 100-year design condition occurring or being exceeded over a consecutive 30-year period. Similarly, there is a 9.6% chance over a consecutive 10-year period.

The predicted water level elevations (for a 100-year storm) are not bound. Extreme storms may cause conditions which exceed the calculated design parameters at any time during the lifespan of the facility. Such an occurrence can cause severe damage. A detail coastal resiliency report has been prepared for the project.

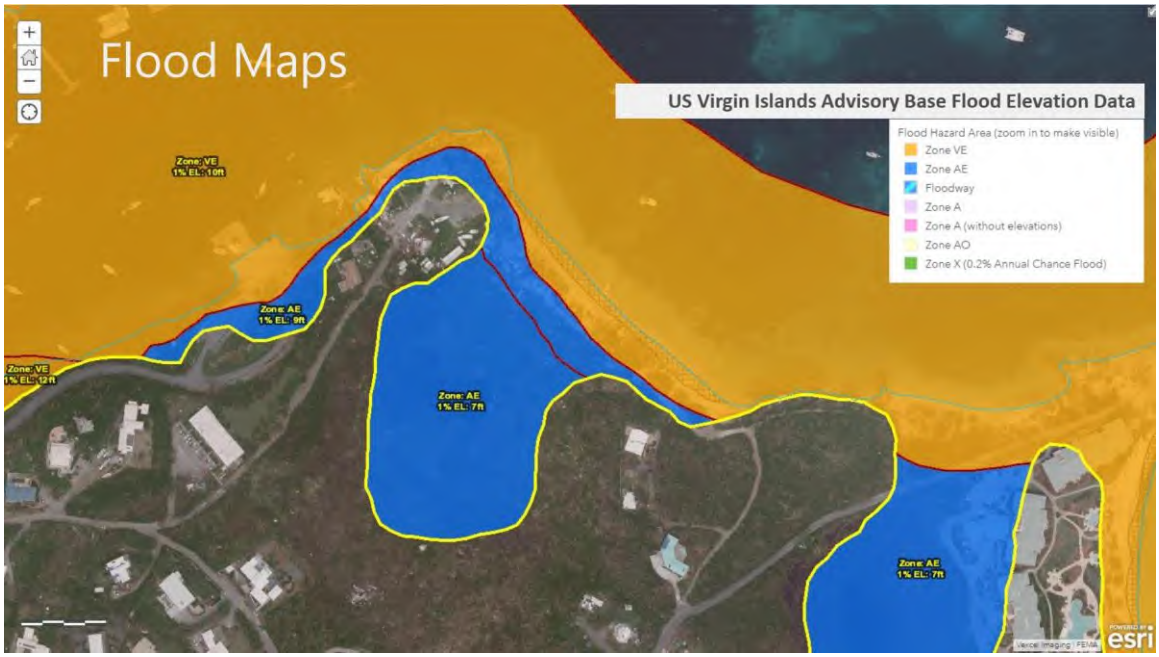


Figure 6.02.2 Base flood elevation data for the project site (US Virgin Islands Advisory).

Figure 6.02.3 National Flood Hazard flood elevations.

The coastal resilience study performed for this project considered the effect of sea level rise in the hurricane impacts. For quantitative analytical purposes, the same “100-year” storm conditions (storm surge and waves) were modelled with the same tools used to generate FEMA flood maps, but for future sea level rise scenarios. This method exposes the increased base flood elevation in high hazard areas. These scenarios were used to evaluate potential future impacts and test possible adaptation measures, specifically to reduce wave impacts. Overall flooding risk was addressed by increasing the fill elevation and construction finished flood elevations to 12ft above mean sea level.

The site resides in multiple zones regarding the FEMA Flood Map. The beachfront area and land adjacent to the proposed marina bulkhead are Zoned VE with a corresponding flood elevation of +10 feet. Based upon this criterion, the minimum finished floor elevation is required to be at +11 feet. To ensure that the Marina Building remains dry and out of the known flood elevation, the finished floor was set an additional +1 foot above the minimum requirement. The Marina Building finished floor has been set at +12 feet.

The other buildings located on-site are within Zone AE according to the FEMA Flood Map. The corresponding flood elevation was generated to be +7 feet. Based upon this criterion, the minimum finished floor elevation for these buildings is required to be at +8 feet. To ensure that the buildings remain dry and out of the known flood elevation, the finished floor was set an additional +1 foot above the minimum requirement. The additional site buildings have a finished floor set at +9 feet.

The U.S. Virgin Islands lie in one of the most earthquake prone areas of the world, and are susceptible to ground shaking, earthquake-induced ground failures, surface fault ruptures and tsunamis (tidal waves) (Hays, 1984). The activity is mostly associated with large-scale tectonic activity or faulting, originating in the Anegada Trough to the northeast of the islands. The trough and its related scarp apparently were thrown up by block faulting during the late Pliocene or early Pleistocene. It is oriented generally northeast to southwest, separating St. Croix from Puerto Rico and the other Virgin Islands. Based on shallow focus earthquakes, the Anegada Fault Trough is estimated to be more than 400 miles in length. There are indications that strike slip movement is occurring, with St. Croix shifting northeast relative to Puerto Rico (Puerto Rico Water Authority 1970). The year 2021 marks the 154th anniversary of the last major earthquake in the islands. This quake, which occurred on November 18, 1867 had an identified intensity of VIII on the Modified Mercalli Scale. Earthquakes of this magnitude have generally been associated with epicentral ground accelerations of between 0.05 and 0.35 gravities. Since the 1868 quake, there has been continuous low intensity activity, all below 6.0 Richter. Thousands of tiny earthquakes are encountered every year on the island.

IMPACT OF SITE GEOLOGY ON THE DOCK

The site geology will be impact how pilings can be installed, based previous projects in the area it is probable that the piles and sheet piles can be driven with a vibratory hammer. If seafloor composition allows the floating wave barrier will be installed with helix anchors, if helix anchors cannot be place anchor blocks will have to be used.

IMPACT OF THE PROJECT ON GEOLOGICAL RESOURCES

A total of 7200cubic yards will be dredged to a depth of 12ft from an area of approximately 5 acres (219,268sf). The dredge and dewatering plans are shown on page 12 of the ATM Latitude Marina Permit Set. The material will be used as fill material on the site.

The site will be graded to address coastal flooding and drainage issues.

6.03 Drainage, Flooding, and Erosion Control

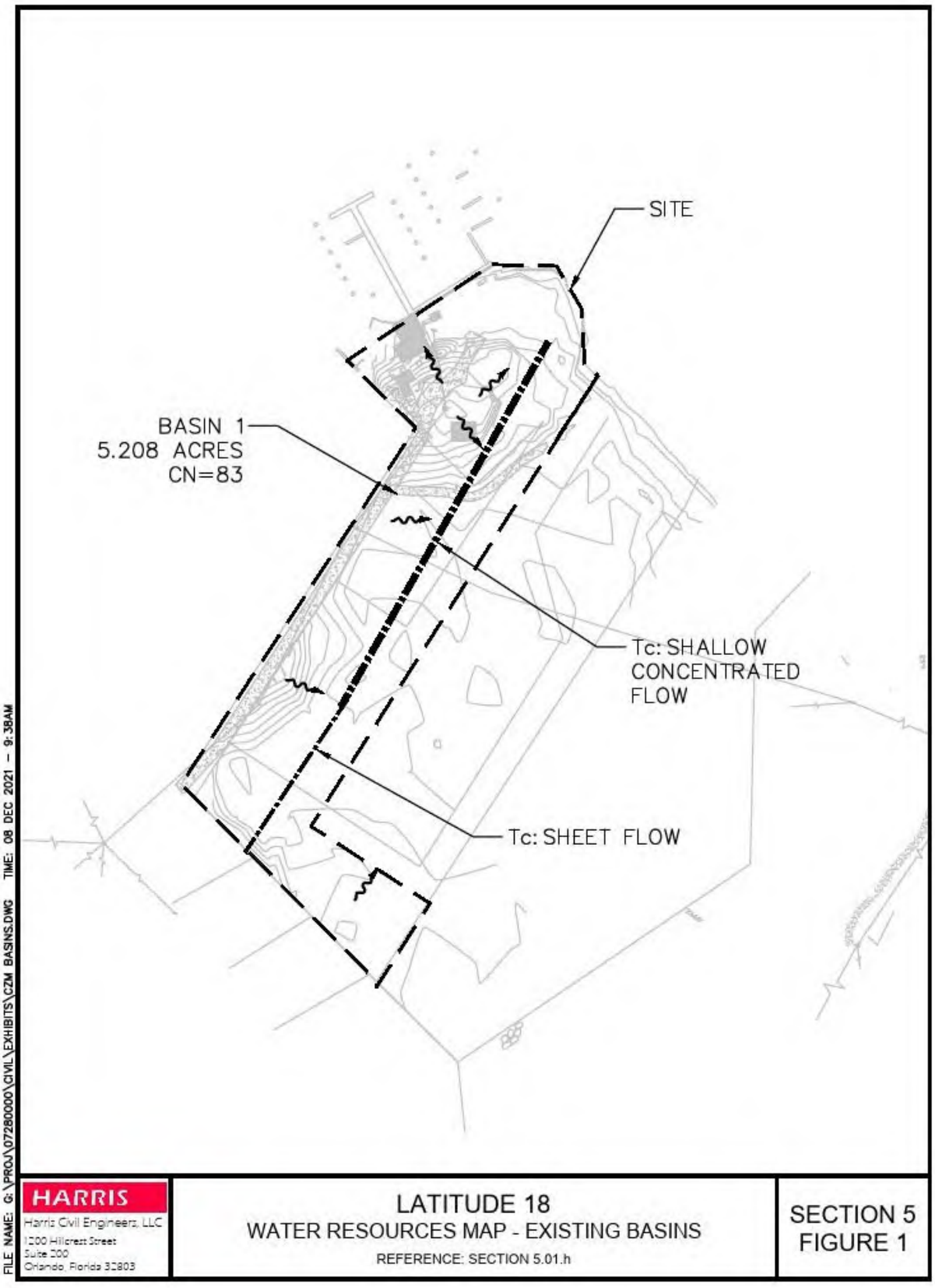
The on-site stormwater pond has been designed to meet or exceed the requirement set forth by the local governing authorities. The stormwater pond was designed to provide water quality treatment for the site immediately after a rainfall event. In this regard, water quality treatment entails collecting the initial flush of runoff during a rainfall event and allowing the sediments and nutrients to be settled and removed within the on-site pond. Per best management practices within the Saint John's River Water Management District, the criteria used to determine the water quality treatment volume was based on the greater volume of either 1" of rainfall across the entire site, or 2.5" of rainfall on impervious surfaces. Per the calculations, a greater volume of runoff was generated by the 2.5" of rainfall over the impervious area. The volume created the 2.5" of runoff constitutes the "water quality" design parameter. This criterion is more stringent than the requirements that are set forth by the local governing jurisdiction, the Department of Planning & Natural Resources.

For any rainfall event, runoff generated on-site will be collected by stormwater inlets strategically located throughout the site. These inlets will initially direct the runoff through secondary stormwater piping to the primary stormwater pond. Under normal rainfall conditions the pond will allow for the settling of sediments and for the uptake of nutrients. In rainfalls which exceed the capacity of the pond the pond will serve to slow the discharge rate of the runoff and will allow some settling of larger particles and materials.

The pre and post development conditions have been modeled in AdICPR4 and shows that for each of the rainfall events run (2-year, 10-year, 25-year, and the 100-year), the post development discharge is lower than the predevelopment. The design is improving the discharge conditions by including the on-site stormwater pond.

Once the stormwater runoff reaches the elevation of the outfall structure weir crest, the water quality treatment of the first 2.5" of rainfall on the impervious surfaces will have been met. When runoff events occur beyond the 2.5" runoff will discharge over the control structure weir. The system has been designed such that the piping will discharge into the pond until it reach it reaches the 2.5" containment then it will begin overtopping the weir and flowing freely into the Bay.

In addition, oil-water separators will be installed downstream of each of the proposed boat washdown areas to prevent the introduction of oils and greases into the marine environment. The washdown runoff from these maintenance operations will be collected in a designated secondary stormwater system that will run through the oil-water separator and then into the on-site pond. A maintenance schedule will be implemented to ensure that oil water separators are cleaned out and collected oil is properly disposed of.



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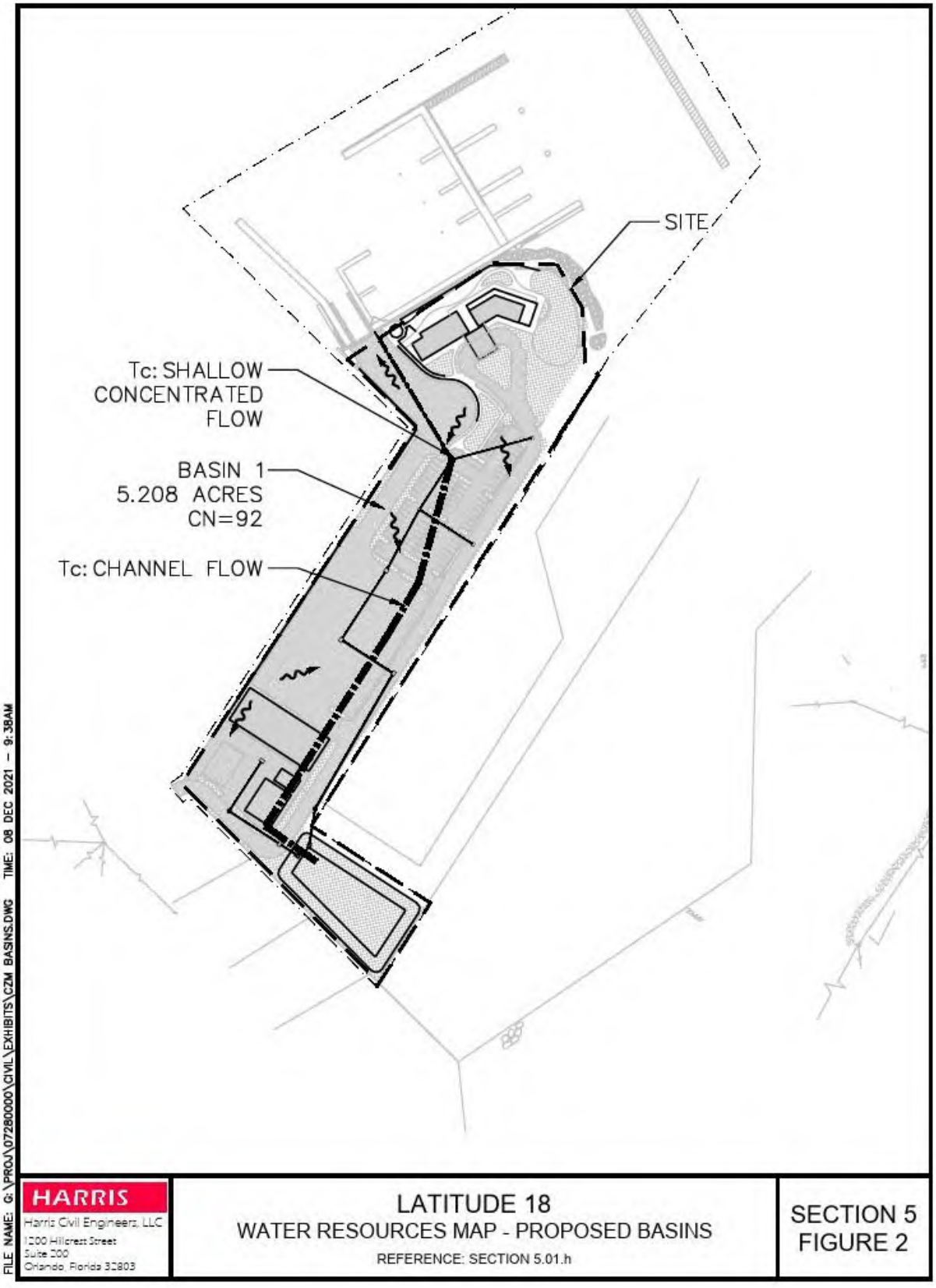
HARRIS
Harris Civil Engineers, LLC
1200 Hillcrest Street
Suite 200
Orlando, Florida 32803

LATITUDE 18
WATER RESOURCES MAP - EXISTING BASINS
REFERENCE: SECTION 5.01.h

SECTION 5
FIGURE 1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BASIN 1
5.208 ACRES
CN=92
Tc: CHANNEL FLOW
FILE NAME: G:\PROJ\07280000\CIVIL\EXHIBITS\CZM BASINS.DWG TIME: 08 DEC 2021 - 9:38AM
HARRIS
Harris Civil Engineers, LLC
1200 Hillcrest Street
Suite 200
Orlando, Florida 32803
LATITUDE 18
WATER RESOURCES MAP - PROPOSED BASINS
REFERENCE: SECTION 5.01.h
SECTION 5
FIGURE 2

6.03h Method of Land Clearing

Most of the site has been developed and as such only limited clearing will occur. Because the property is within the critical habitat for the Virgin Islands Tree Boa, clearing will follow the Tree Boa Protocol developed by the Division of Fish and Wildlife and the new FWS Boa Biological Opinion with the initial clearing being done by hand and in the direction of other forested areas. Immediately following the clearing, erosion and sediment control measures will be put into place as described in sections 5.01d – e of this report.

After hand clearing areas to be developed, most of the site will be machine cleared and excavated at the beginning stages of construction. Existing trees will be removed by and disposed of as necessary according to the Tree Removal Plan. Trees that are designated to remain will be protected during construction.

Furthermore, only the land within the limits of construction will be cleared. The clearing activities will be scheduled so that the existing soil is exposed to erosion for the shortest period that is reasonably possible.

6.03i Provisions to Preserve Topsoil and Limit Site Disturbance

Immediately following site clearing, erosion and sediment control measures will be installed. Furthermore, all topsoil located during site clearing will be immediately excavated, stockpiled, and protected from exposure to wind and water through the use of a geotextile. The topsoil will be used as necessary in the landscape areas.

The dock and mooring locations have been located to minimize impact on the marine environment by avoiding all ESA listed corals, non-ESA corals, seagrass beds and minimizing hard bottom impacts. Turbidity control and water quality monitoring will be implemented as well as sea turtle monitoring to minimize acoustic impacts. Areas will be cleared by hand to minimize impact to the VI Tree Boa. The Revised Tree Boa protection plan is found in Appendix C.

6.05 Oceanography

6.05a Seabed Alteration

Localized seabed impacts are expected due to pile installation for fixed piers and the installation of anchor systems for floating wave attenuator and for the mooring buoys. Localized impacts will also be caused due to dredging of seabed material as part of the reprofiling of the seabed adjacent to the rebuilt bulkhead and the rectification of a portion of the disturbed irregular shoreline, required for the bulkhead construction. The area of dredging has increased and a total of 7200cubic yards will be dredged to a depth of 12ft from an area of approximately 5 acres (219,268sf).

The marina docks and floating wave attenuator have a continuous deck that will cause localized shading impacts. The approximate total surface of decking of the marina docks and access structures is 21,550 sq ft, of the dinghy dock and access facilities surface area is 1,570 sq ft and of the decking of the floating

wave attenuator is 6080 sq ft. The docks will require 274 piles, there will be 12 mooring piles and there will be 16 piles associate with the travel lift.

These impacts are unavoidable for the development of a marina and were minimized my design or mitigated, as follows:

- The proposed design seeks to reduce the number of piles by avoiding the use of mooring piles between slips and by using partial length fingers. The previous marina had dock pier structural piles and also mooring piles between each slip.

- The proposed water depths near the bulkhead were reduced to only accommodate smaller draft vessels, as opposed to the ideal design depth to maximize the marina efficiency, to reduce the seabed impact. The required water depth for mono-hull yachts of the size envisioned requires -8 ft msl water depth, which resulted in a 18,325 sq ft area impact and 2,260 cy of material to be removed from the seabed. An alternative was proposed to locate catamarans in those slips and providing a design depth of -6.5 ft MSL. A total of 7200cubic yards will be dredged to a depth of 12ft from an area of approximately 5 acres (219,268sf).

- The floating wave attenuator performance to reduce agitation is driven by the structure width. Wider floating elements provide more wave attenuation than narrower ones. The structure is intrinsically massive and opaque. The only impact reduction strategy available is to design the attenuator with the minimum width that serves the required function. Grated decking for light floating element structural solutions were explored and considered unfeasible. The actual seabed impact is ultimately minor because the water depth is on the order of between 18 and 28 ft.

- All mooring buoys will be anchored to the seabed by drilled anchors and connected to the buoy bollard with elastic rods. This mooring buoy design solution avoids seabed impacts during operation. Alternative anchorage systems, such as anchor and chain which is common in this area at present, and boat anchors typically cause significant seabed damage, as documented in this section.

6.05B TIDES AND CURRENTS

The Virgin Islands coastal areas are not subject to significant tidal ranges or tidal currents. Due to the small size of the island, the sea flows around the island causing an average tidal height of only a few inches and maximum change of only a little over a foot. Only very narrow intertidal zones are found because of this lack of tidal amplitude and the steepness of the island rising out of the sea. The tides within Red Hook Bay are primarily semi-diurnal in nature, with two cycles of high and two of low water every 24 hours. The second cycle is often indistinguishable. The mean tides range from 0.8f. to 1.0 ft and the spring tidal ranges reach up to 1.3ft (IRF 1977). There are no notable locally driven tidal currents due to the lack of confinement within the area. NOAA has a tide gauge in Charlotte Amalie which is a southern exposure which has been recording water levels since 1975. The high tide recorded on September 18, 1989 (Hurricane Hugo) was +3.35ft, and in 1995 during Hurricane Marilyn the Charlotte Amalie tide station recorded the highest tide height 3.98ft above Mean Lower Low Water (MLLW). The lowest tide recorded was on February 6, 1985, and was -1.44ft. The tidal ranges of the Charlotte Amalie station are as follows:

Mean Higher High Water	1.09ft
Mean High Water	0.94ft
Mean Tide Level	0.54ft
Mean Sea Level	0.52ft
Mean Low Water	0.13ft
Mean Lower Low Water	0.0ft

There is also a Tide Station in Redhook (Station ID: 9751540), the station is located at latitude 18° 19.6 N and longitude 64° 51.1 W and has a mean tidal range of 0.82ft and a diurnal range of 1.09ft.

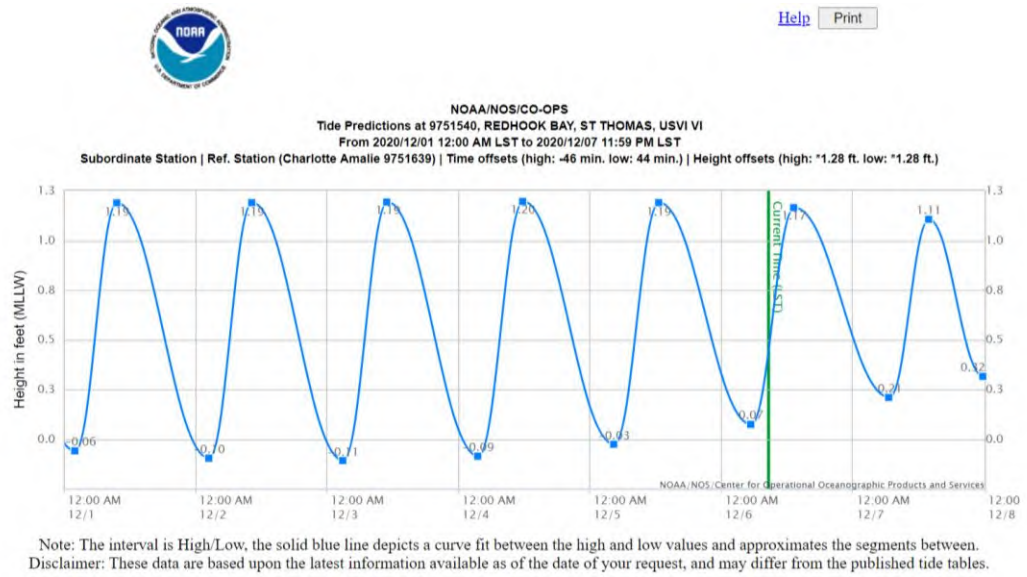


Figure 6.05.1. Tidal data from the Redhook Tidal Station (NOAA Buoys)

The surface currents throughout the Caribbean are driven by the North Equatorial Current that runs through the islands west-northwest and then joins the Gulf. These currents
change very little from season to season with the currents coming more from the south during the summer months. Because of the shallowness of the Caribbean basin of less than 1000m, mainly surface water from the Atlantic flows through the islands. The westerly drift of the Caribbean Current sweeps into Pillsbury Sound from the Southeast, seeking a way North through the barrier set up by the Cays to discharge along the North Shore of St. Thomas and out into the Atlantic. Tidal currents in the vicinity of marina and mooring field project are very small and highly influenced by wind. Measured currents are generally about 3 centimeters per second (cm/s). ATM conducted tidal and current measurements for the calibration of the water circulation model (ATM 2020)
The measured data shows that there is no significant variation in the tidal signal between Muller Bay and the upper end of Vessup Bay, i.e. no damping or amplification.

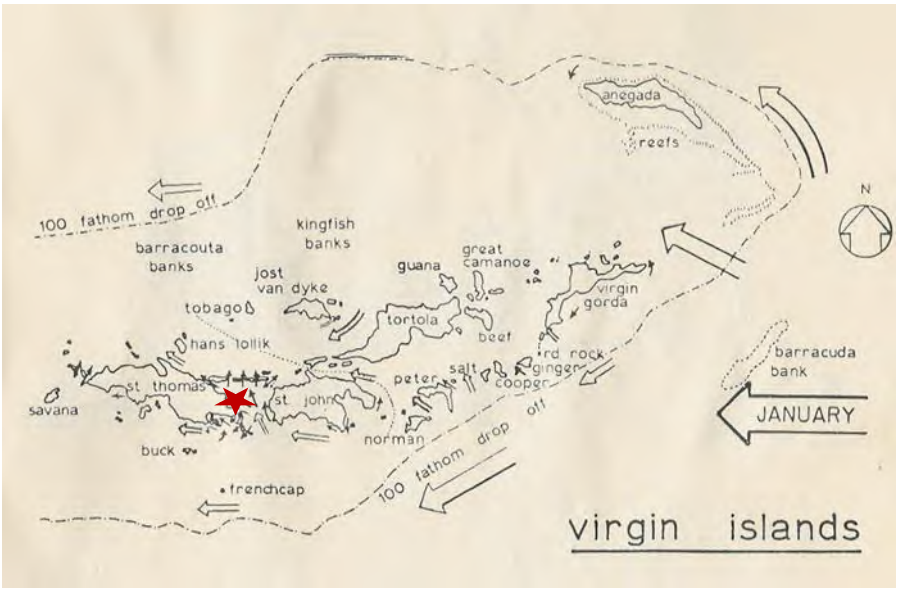


Figure 6.05.2 Currents surround the northern islands and Cays (IRF 1977).

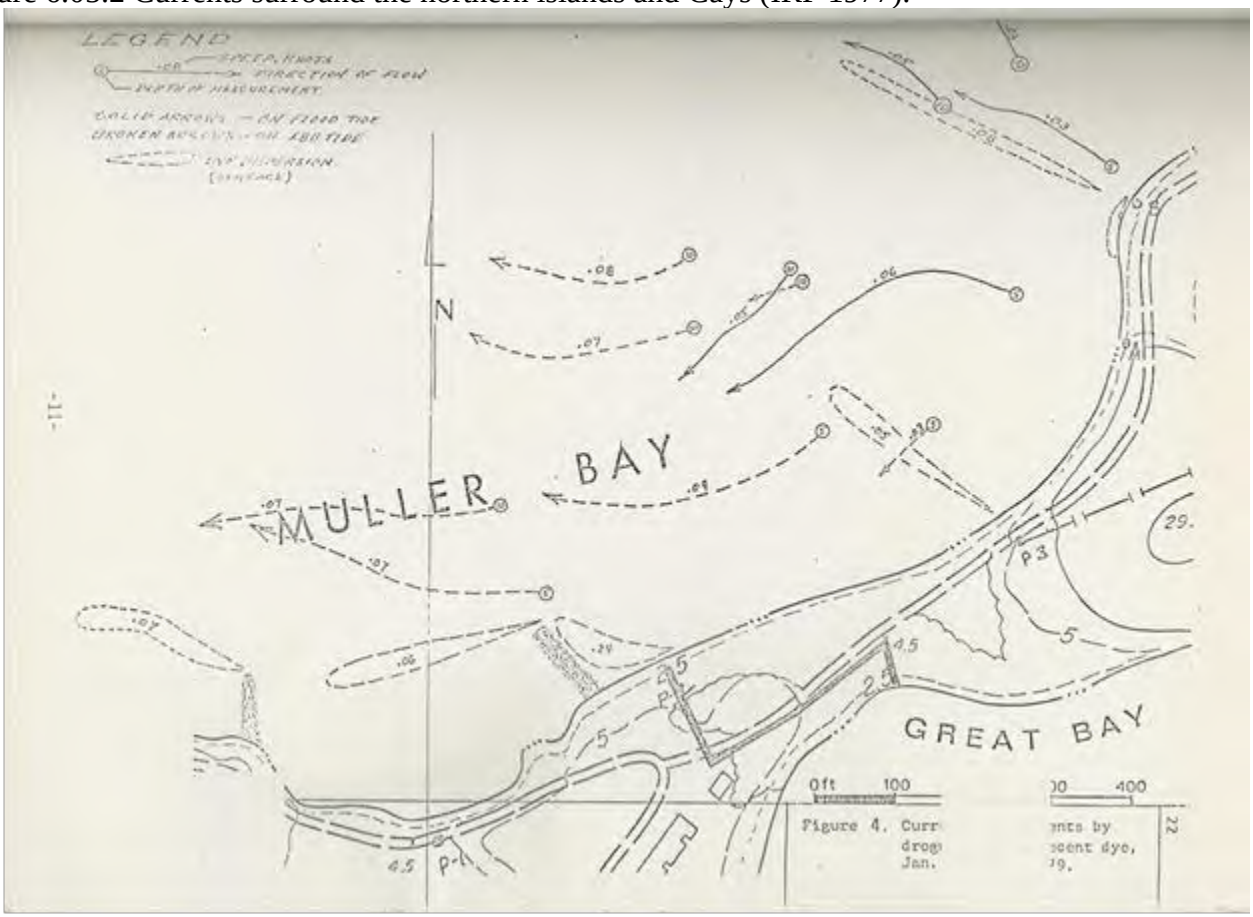


Figure 6.05.3 Currents in Muller Bay.

6.05C WAVES

The deep-water waves off Red Hook Bay are primarily driven by the northeast trade

winds that blow most of the year. Waves average from 1 to 3ft from the east, 42% of the time throughout the year (IRF, 1977). For 0.6% of the time easterly waves reach 12ft in height. The southeasterly swell with waves one to twelve feet high become significant in late summer and fall when the trade winds blow from the east or when tropical storms and hurricanes pass the islands at a distance to the south. During the winter months, long length, long period northern swells develop to a height of 1 to 5 feet. The USACE Hindcast Studies for buoy 61022 the two buoy whose waves patterns directly affect the project area, shows that a majority of the waves which occurred approach from easterly directions.

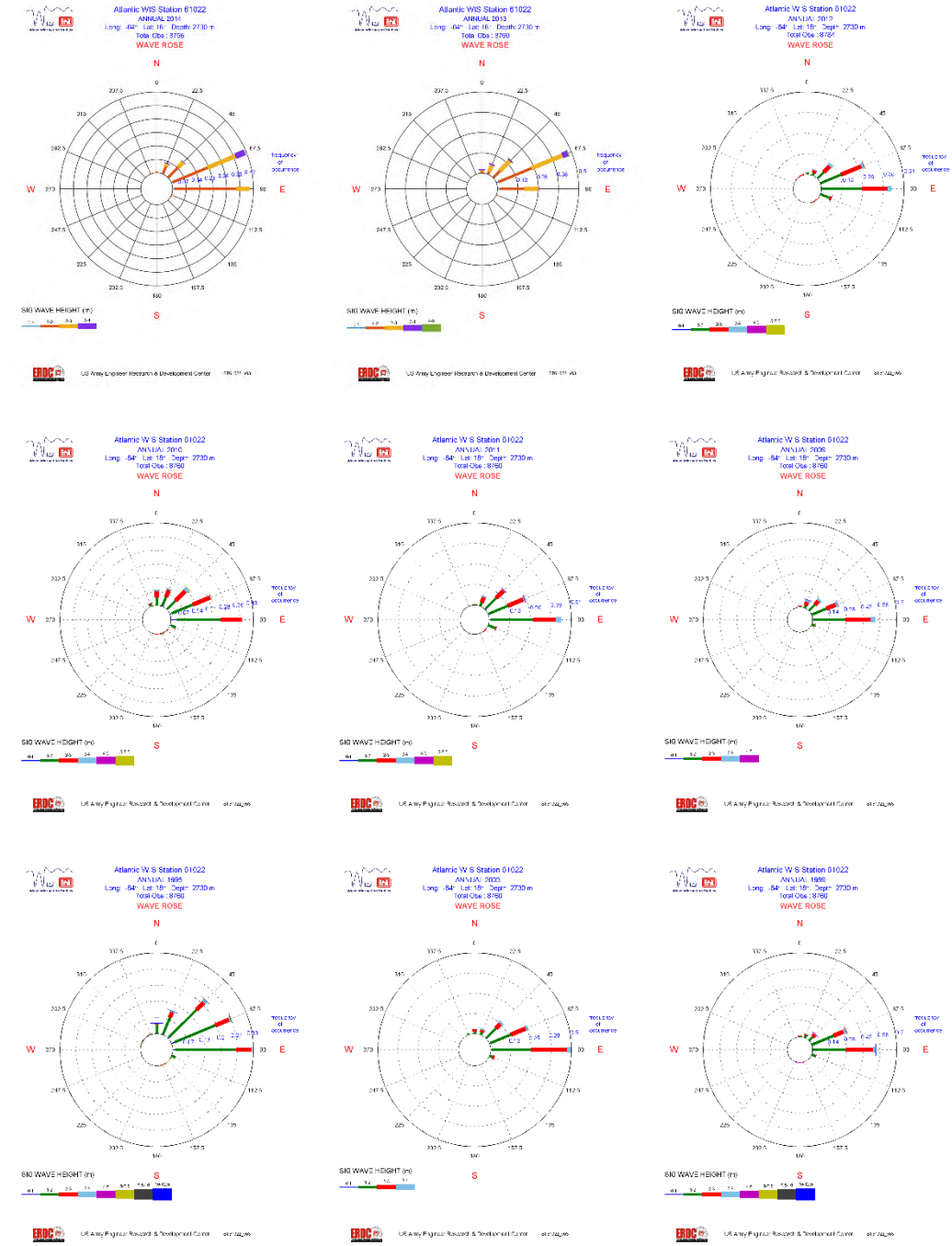


Figure 6.05.4. Wave Roses from the USACE Wave Information Studies for buoy 61022.

The property and the area proposed for the marina are exposed to hurricane waves and winter storms. An older timber dock marina facility in this same location was destroyed by cumulative impacts of various hurricanes over the years.

Detailed studies were performed to determine design conditions for extreme events and operational conditions of the marina.

Locally generated waves

Local waves at the Vessup Point Marina site were studied to assess agitation under normal conditions. The analysis was carried out with the aim of quantifying the short-period waves "typical wind chop" characteristics in the proposed marina berthing zone in order to identify control measures, such as wave attenuation devices.

The USACE wave forecasting model, ACES (USACE, 1992), was used to evaluate the potential locally generated short-period wind-wave conditions at the site. The critical fetches were used to calculate predicted wave characteristics for different wind speed intervals. Summary tables of wave calculations are given below.

Table 6.05.1 Significant Wave Height Occurrence

Wave Height Range (ft)		**Occurrence* (%)**
<0.50		**10.7**
0.50	**0.70**	**46.5**
0.70	**1.00**	**10.2**
1.00	**1.30**	**3.5**
>1.30		**0.4**

Table 6.05.2: Wave Peak Period Occurrence

Wave Period Range (s)	**Occurrence* (%)**
<2	57.3
2 to 3	14.0

*** Note**: Wind waves from the 3 directions analyzed account for 71.3% of all waves. Winds over 7.5 mph occur 60.6% of the time on an average December month from these directions.

Extreme Events

Extreme event wave modeling was conducted to assess the marina development site, in addition to the analysis of FEMA Flood maps.

Based on the desktop review of tidal data, the wave studies and using the local mean sea level (MSL) as the vertical reference, the following still water levels and wave crest elevations are considered representative of conditions in the marina site:

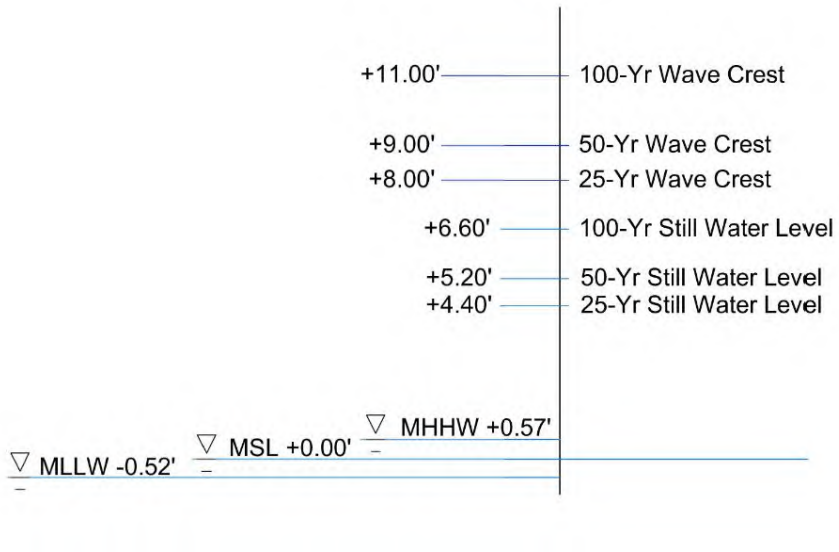


Figure 6.05.5: Summary Water Elevations. (*Wave crest values vary depending on project site's location.)

Storm Surge

Table 6.06.6 presents a summary of storm surge levels for the 10-, 25-, 50-, and 100-year recurrence intervals at the project coastline of the project site.

Return Period (Year)	FEMA* (Feet, MSL)
10	3.4
25	4.4
50	5.2
100	6.6

* FEMA Flood Insurance (FIS) Report for US Virgin Islands (25-yr value based on interpolation)

The Federal Emergency Management Agency (FEMA) Flood Insurance Study for the U.S. Virgin Islands is shown in Figure 6.03.1.

For 25-year return period storm conditions, open ocean swell is able to diffract around the surrounding islands and land masses and impact the site. The associated wave heights with these swells, however, are relatively minor (typically less than 0.3 m) as the offshore swell heights are reduced significantly before reaching the site. The controlling 25-year wave conditions are primarily due to shorter period locally generated wind waves which can reach up to 1.5 m at the site with periods of approximately 5 seconds.

Extreme Wave impacts with sea level rise and climate adaptation

Further analysis of Sea Level Rise impacts on Coastal Development was studied for the design storm condition (1% annual exceedance) for upland impacts and climate adaptation.

6.05D MARINE WATER QUALITY

The offshore waters are classified as Class B and the best usage of the water is listed as the propagation of desirable species of marine life and for primary contact recreation (swimming, water skiing, etc.). The quality criteria include dissolved oxygen not less than 5.5mg/l from other than natural conditions. The pH must not vary by more than 0.1 pH unit from ambient; at no time, shall the pH be less than 7.0 or greater than 8.3. Bacteria (fecal coliform) cannot exceed 70 per ml, and turbidity should not exceed a maximum nephelometric turbidity unit of three (3) NTU.

Water sampling has occurred on the site over the last several of years in order to establish a baseline of water quality conditions. Samples were taken with a calibrated YSI EXO multi-meter and were taken at a depth of 1 meter. The samples from 2019 and the beginning of 2020 were focused within the marina. As the idea of a managed mooring field was considered additional sampling locations were added (Table 6.05.3). Samples were also taken during the current study which are provided in Table 6.05.4.F The map below shows the location of the samples.

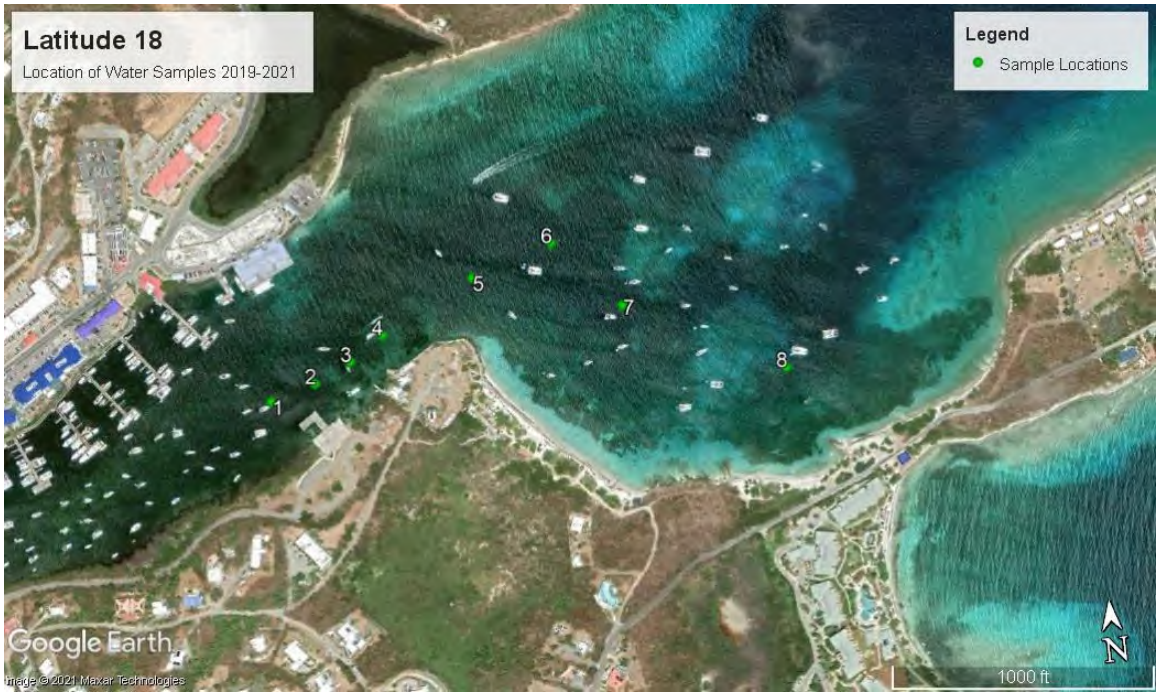


Figure 6.05.3 Location of samples taken between 2019 and 2021

		Turbidity NTU														
Station	Location	5/13/2019	6/15/2019	8/22/2019	9/19/2019	10/22/2019	12/5/2019	3/17/2020	5/15/2020	8/20/2020	11/1/2020	12/3/2020	1/14/2021	2/20/2021	3/17/2021	4/19/2021
1	18.324763°-64.849718°	2.11	3.26	5.6	2.99	1.77	2.16	2.76	6.78	3.32	0.98	1.23	2.09	1.12	2.14	0.78
2	18.324904°-64.849217°	1.12	0.87	2.13	1.23	1.18	1.43	1.09	2.76	2.14	0.47	0.98	1.34	0.87	1.16	0.87
3	18.325089°-64.848813°	1.08	0.67	1.78	1.01	0.97	0.88	1.25	2.34	2.03	0.46	0.99	0.86	0.78	1.43	0.67
4	18.325330°-64.848435°	0.86	0.56	2.08	0.94	0.89	1.1	0.98	0.88	2.09	0.68	1.02	0.67	0.78	1.34	0.87
5	18.325815°-64.847384°	0.82	0.65	1.59	0.96	1.11	0.92	0.65	0.67	1.34	0.73	0.78	0.56	0.67	85	0.81
6	18.326089°-64.846486°												0.77	0.62	0.54	0.76
7	18.325368°-64.845776°												0.81	0.31	0.56	0.81
8	18.324541°-64.844065°												0.65	0.78	0.45	0.51
		Dissolve Oxygen mg/l														
Station	Location	5/13/2019	6/15/2019	8/22/2019	9/19/2019	10/22/2019	12/5/2019	3/17/2020	5/15/2020	8/20/2020	11/1/2020	12/3/2020	1/14/2021	2/20/2021	3/17/2021	4/19/2021
1	18.324763°-64.849718°	4.66	3.31	4.13	5.12	3.54	4.41	5.11	4.98	4.63	5.56	5.37	4.61	3.21	4.11	4.89
2	18.324904°-64.849217°	6.49	5.26	5.26	4.63	6.43	6.66	6.38	6.18	5.99	6.09	6.06	6.06	4.79	3.60	5.18
3	18.325089°-64.848813°	6.46	6.06	6.06	4.56	6.45	6.70	6.29	6.05	6.11	6.21	6.32	6.32	2.32	5.46	5.97
4	18.325330°-64.848435°	4.31	6.32	6.32	5.33	5.67	5.20	6.55	6.00	6.12	6.19	6.85	6.85	6.59	4.84	5.74
5	18.325815°-64.847384°	4.10	6.85	6.85	5.26	5.78	5.29	6.51	5.86	6.14	6.06	6.45	7.11	6.72	4.58	5.68
6	18.326089°-64.846486°												6.11	6.21	6.12	5.78
7	18.325368°-64.845776°												6.04	6.09	6.23	6.01
8	18.324541°-64.844065°												5.99	6.07	6.00	6.03
		pH														
Station	Location	5/13/2019	6/15/2019	8/22/2019	9/19/2019	10/22/2019	12/5/2019	3/17/2020	5/15/2020	8/20/2020	11/1/2020	12/3/2020	1/14/2021	2/20/2021	3/17/2021	4/19/2021
1	18.324763°-64.849718°	8.34	8.20	8.39	8.31	8.38	8.37	8.11	8.37	8.33	8.40	8.38	8.36	8.33	8.29	8.37
2	18.324904°-64.849217°	8.20	8.33	8.39	8.31	8.35	8.40	8.29	8.34	8.31	8.36	8.38	8.31	8.31	8.26	8.37
3	18.325089°-64.848813°	8.39	8.34	8.30	8.35	8.35	8.37	8.26	8.33	8.34	8.31	8.38	8.33	8.34	8.23	8.40
4	18.325330°-64.848435°	8.38	8.33	8.30	8.35	8.28	8.40	8.23	8.25	8.38	8.33	8.40	8.33	8.38	8.33	8.37
5	18.325815°-64.847384°	8.25	8.33	8.40	8.38	8.26	8.40	8.33	8.25	8.40	8.33	8.37	8.38	8.40	8.37	8.40
6	18.326089°-64.846486°												8.38	8.40	8.34	8.40
7	18.325368°-64.845776°												8.38	8.36	8.33	8.11
8	18.324541°-64.844065°												8.40	8.31	8.25	8.29

Table 6.05.1 Water samples taken in the vicinity of the dock and mooring field between 2019 and 2021.

Location	Date	Turbidity	Dissolve Oxygen
18.324225°-64.837556°	8/15/2020	0.91 NTU	6.21mg/l
18.324225°-64.837556°	9/5/2020	0.76 NTU	5.99mg/l
18.324225°-64.837556°	9/12/2020	0.49 NTU	6.18mg/l
18.324225°-64.837556°	10/1/2020	0.68 NTU	6.32mg/l
18.324225°-64.837556°	11/3/2020	0.71 NTU	6.43mg/l
18.324225°-64.837556°	11/22/2020	0.47 NTU	6.17mg/l

Table 6.05.2 Water samples taken in dock footprint in 2020.

Existing conditions

Existing water quality in Vessup Bay is poor and it is listed as Impaired Waters under CWA Section 303(d).

Water exchange is very weak and highly dependent on wind conditions to force circulation and improve mixing, as tidal flows are extremely low.

Based on the calibrated circulation model implemented by ATM for Vessup Bay, water exchange under average wind conditions is less than 75% in 10 days. Exchange improves to 90% in 9 days for the high wind conditions but decreases to 40% in 10 days for low wind conditions.

In addition to poor circulation, Vessup Bay receives pollutant discharges, including a public WWTP and has no enforceable management of discharges by many of the boats anchored in the bay.

Water circulation improves in Mueller Bay due to increased mixing and better circulation given the larger water body and positive influence of wind-driven mixing.

The marina location in Vessup point is in the transition between the poorly flushed Vessup Bay and the

better-mixed waters of Muller Bay.

The change in water quality is visible in the data collected overtime across the site. Turbidities are higher farther into Vessup Bay and dissolved oxygen is lower. Water quality shifts across the site with the changing tides.

IMPACT OF PROPOSED PROJECT

During construction, the seafloor will be disturbed through the cleanup of debris, removal of existing pilings, and then by the dredging, de-watering and pile driving. A water quality plan will be implemented monitor control devices, and water quality and to ensure control features remain in good repair and that additional measures are added or implemented as necessary to maintain ambient water quality.

If properly executed there should be minimal impact to marine water quality.

A specific flushing study was conducted to determine the project design that will cause no negative impact to circulation in Vessup Bay. In addition to showing no negative impact, the proposed mooring field management includes the installation of a sewage pump out station and the enforcement of no-discharge requirements within the mooring field, which should improve water quality in Vessup Bay.

6.06 MARINE RESOURCES

Benthic Habitat Description
General

The project site lies within Red Hook Bay at the intersection of Vessup and Mueller Bay, due to the differences of exposure, circulation and use the water quality to the north of the project site is extremely different that the water quality to the east. Vessup Bay is a very narrow bay which extends just under 0.5miles inland and is only 0.1mile at its widest. The discharge from the Vessup Bay WWTP is located at the very head of Vessup Bay. Vessup Bay is a heavily used for marine uses, with marinas and docks and the Red Hook Marine Terminal is located immediately across the bay from the project site. The Terminal includes the landing and facility for ferries transiting to St. John and the British Virgin Islands and the landing for car ferries from the island of St. John. Over the last few years Vessup Bay has been significantly impacted by *Sargassum* further impacting the water quality.

At the project site Red Hook Bay opens to 0.34 mile in with and Mueller Bay is located to the east and has significantly more flushing than Vessup Bay and has significantly improved water quality. During surveys, the turbid plume from Vessup Bay was observed moving into or out of the marina area.

Vessup Bay is mangrove lined on the southern shoreline and while the bay used to have relatively large *Thalassia testudinum* and *Syringodium filiforme* beds the bay bottom is now dominated by the Halophila *stipulacea* and macro algae. Only small, scattered seagrass beds remain. Very few corals are found on hard substrates within Vessup Bay, on the VIPA terminal across the bay there are a very few small *Diploria strigosa, S. siderea, S. radians* and *D. labyrinthiformis* on the pilings.

Offshore bay supports seagrass beds composed of *Thalassia testudinum, Syringodium filiforme, Halodule beaudettei, Halophila decipiens* and more recently *Halophila stipulacea*. There are ESA listed coral species which occur on the reefs that fringe each side of the bay and the rocky promontories at Redhook Bay's entrance.

Methods

The area was surveyed on both SCUBA. Mooring locations and corals were located by GPS and were mapped to assist in locating the proposed dock. Species were identified to species within the project area.

The NOAA NOS Benthic habitat map, depicts. This is an accurate description of the benthic habitats within the area. The NOAA NOS map is provided below followed by a benthic habitat map. Inner Vessup Bay is shown as mud with small areas of seagrass along the sides of the bay. The inner harbor is heavily algal colonized, and there is sparse seagrass along the edges. The area immediately off the marina site is shown as sand. This area is colonized by scattered algae and *H. stipulacea.* The NOS map shows seagrass 70-90% offshore, this area is more in the order of 30-40% and this area is highly impacted by *H. stipulacea*, anchors, ropes, and debris. The NOS map shows seagrass continuous along the eastern shoreline, again the seagrass is closer to 50%. The map shows an area of dredging in the bay which shows in the historic aerials shown in Section 6.02.

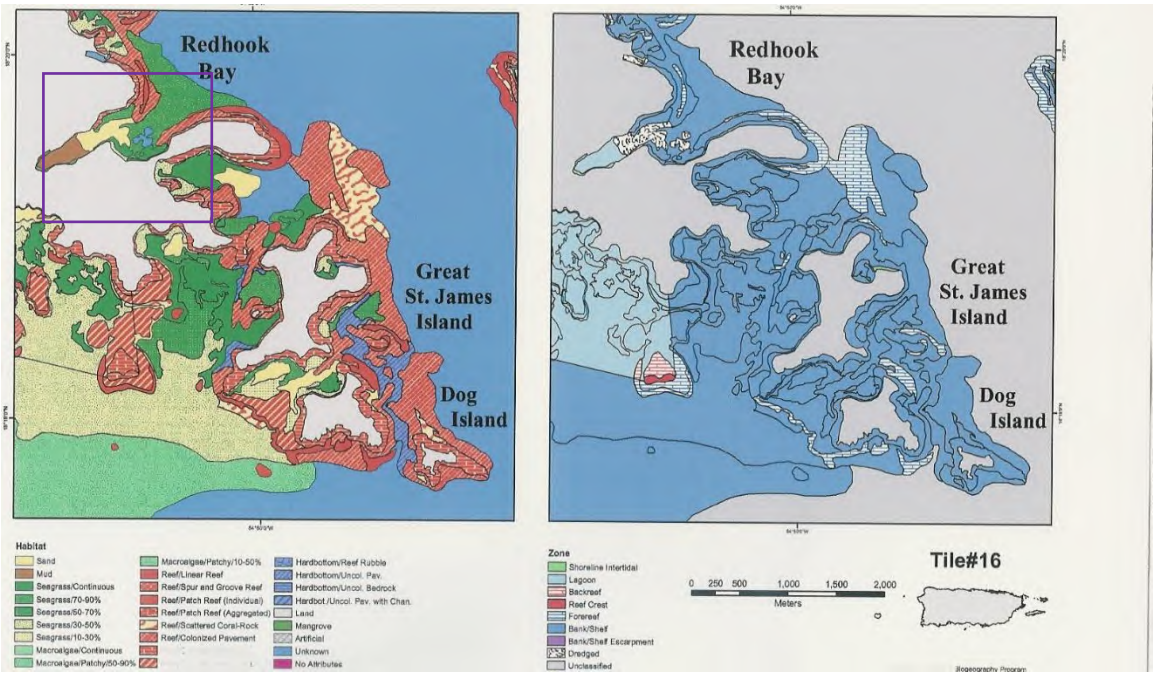


Figure 6.06.1. NOS Benthic Habitat Map Tile 16. Great Bay is shown within the blue box, and the project site is indicated by the red star.

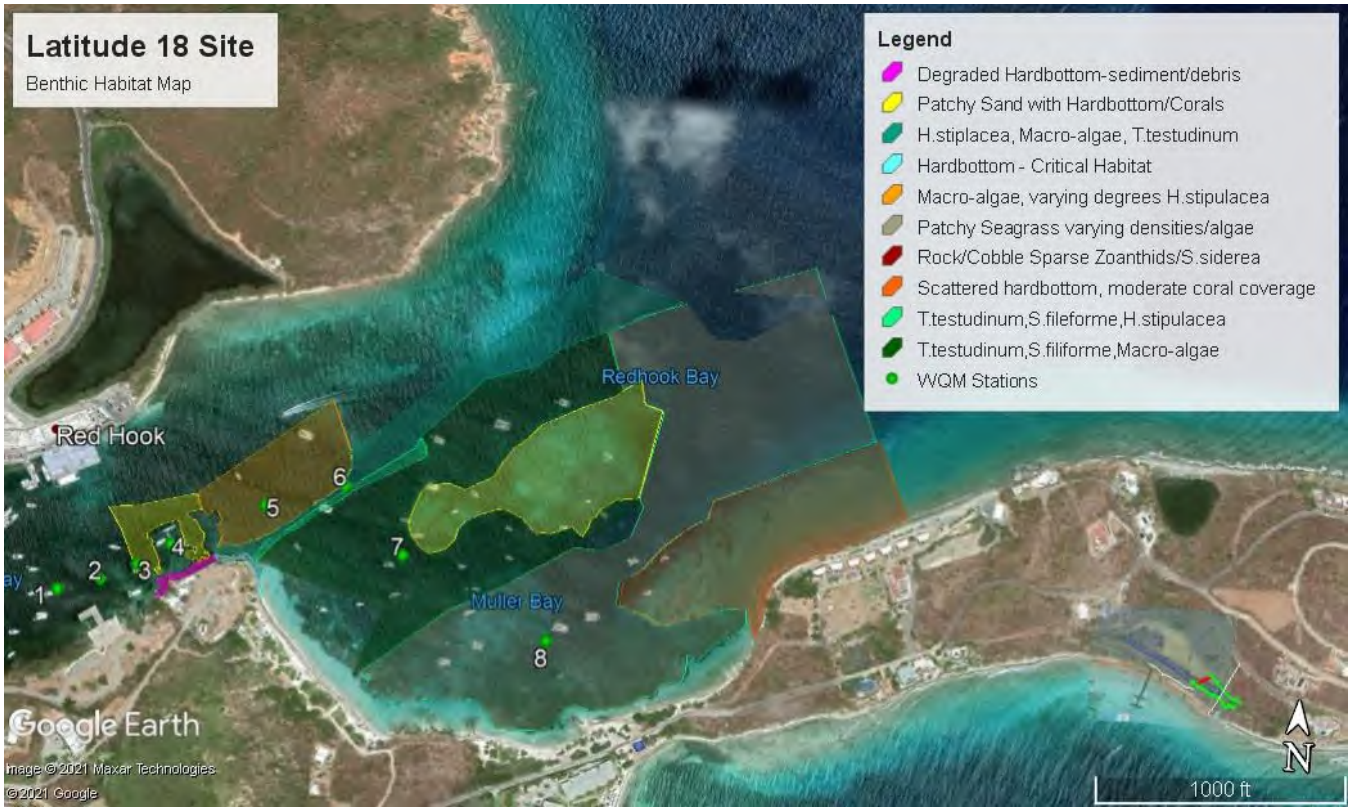


Figure 6.06.2 Benthic Habitat in the marina area

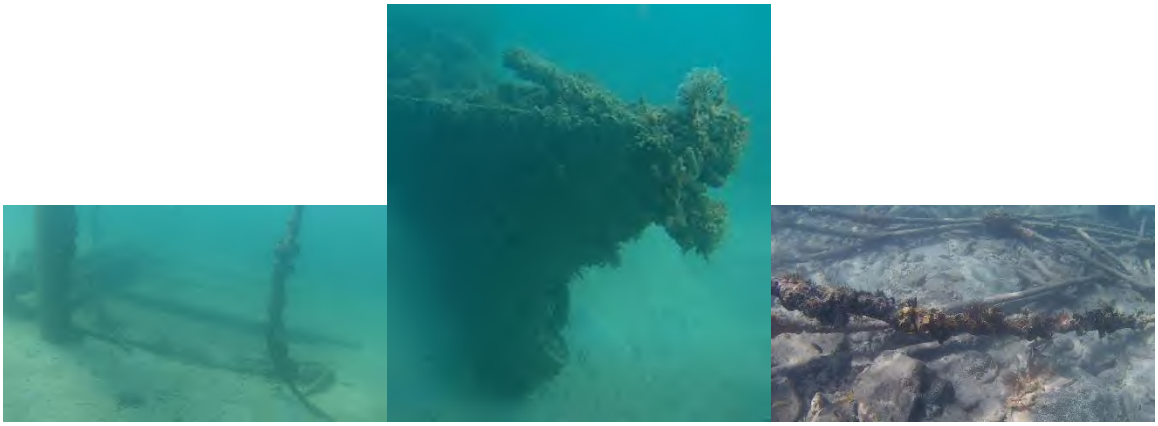
Vessup Bay

The project area is significantly impacted by the activities which occur within the bay, the boating, the marine vessel discharges, the debris from vessels, the suspension of vessels from propwash and vessels grounding and resuspending sediments and impacting bottom sediments and colonization. The area is also subject to high nutrients from the WWTP effluent discharge. There are however impacts that are the result of natural phenomena, not just the hurricanes, but the accumulation of Sargassum weed in the head of the bay. The weed accumulates blocking light to benthic organism and then later settles on them as the algae losses its floats and slowly sinks. All the shallows of the very inner bay have been impacted by the Sargassum.

In the areas shallower than 1' algae is the most abundant colonizer and *Enteromorpha flexuosa, Chaetomorpha sp., Neomeris annulata, Laurencia, Avrainvillea nigricans, Penicillus capitatus, Caulerpa, Acetabularia, Hypnea, Dictoya, Wrangelia,* and *Halimeda* are all present. *Caulerpa spp.* are probably the most abundant. These are scattered amid exposed patches of mud and areas of disturbance. *Halophila stipulacea* has become the most abundant deeper than 1' and covers larger areas than the algae did in shallower water. There are large uncolonized areas, many of which look as though they were the result of vessel activities. There are scattered pieces of debris and broken limbs throughout the Vessup bay. Near the fringing mangrove there are patches of *Thalassia testudinum.*

Marina Footprint and Wave Attenuator

The marina area is impacted by water quality and by the heavy marine activity which has occurred in the area overtime. Offshore around the eastern portion of the old marina the area is a mix of sand and *H. stipulacea*. The pilings and debris which remain in the area are heavily algal colonized with sparse sponge colonization. The stone bulkhead is heavily algal colonized with very sparse corals, palythoas and sponges which are found on bulkhead and stones which have been broken loose from the wall. *Siderastrea siderea, Pseudodiploria strigosa, Zoanthus puchellus* and *Palythoa caribbaeorum* are found on the bulkhead and loose rocks. Millepora alcicornis is found on some of the larger debris and on some of the cables. *Monanchora unguifera, Desmapsamma anchorata,* and *Spirastrella spp*. are found on debris and pilings. *Caulerpa, Cladophora, Cladosiphon occidentalis Acanthophora, Penicillus, Halimeda, Dictyota, Laurencia, Hypnea* and *Cheatomorpha* are all present within the marina footprint.



The seafloor is a mix of uncolonized sand, *Halophila stipulacea*, and scattered *Halimeda opuntia, Udotea flabellum* and *Penicillus capitatus*.

The sponges and corals represent less than 1% of the total bottom cover within the marina area.

Moving to the east there are scattered patches of *algae* amid denser *H. stipulacea*. Moving to the south around the point there is a mix *of Thalassia testudinum* and *H. stipulacea*.

Mooring field and Surrounding Area

There are vast seagrass beds within Muller Bay. The composition and densities of these beds vary with depth and disturbance. The seagrasses *Thalassia testudinum* is intermixed with *Syringodium filiforme* and a minimal amount *Halodule wrightii* can be found. There are some isolate areas where Syringodium is the dominant grass and others where *Thalassia* is the dominant grass. The invasive seagrass is most abundant to the north nearest the channel, but small areas of *H. stipulaceae* were found in the seagrass beds to the south. Found within these beds and within blowout areas are the algae *Caulerpa, Cladophora, Cladosiphon occidentalis Acanthophora, Penicillus, Halimeda, Dictyota, Laurencia, Hypnea* and *Cheatomorpha*. In the outer bay, the seagrass cover ranges between 20 to 100% per meter squared and have blade densities of 17 to 444 blades per m*2*. In the inner bay the coverage is lower due to impact by mooring and anchoring vessels and the maximum coverage is between 30-40%. *Thalassia* is more prevalent in the shallower areas and *Syringodium* dominates at depth.

Towards the east there becomes a mixture of coral colonized cobbles and exposed broken pavement in the grass beds and *Orbicella spp*. and *Porites astreoides* are common.

Within Muller Bay there are areas of dense *Thalassia testudinum* colonization often mixed with *Syringodium filiforme* and areas of dense colonization by invasive *Halophila stipulacea*. Green algae (*Halimeda spp., Udotea spp., Penicillus capitatus*) abundant in seagrass. *Dictyota pulchella* abundant in bushy tangled clumps among seagrass and green algae species.

The algae makes up as much as 50% of the bottom cover in some areas. Seagrass abundance varies from *T. testudinum* to *S. filiforme* as the most abundant.

Debris is found throughout the seagrass and algal beds. There are sunked boats, and pieces of upland debris.

There are several sunken vessels, dinghies and even a historic anchor which someone was using as a mooring.

There are large scars that are the result of moorings. These are the result of mooring ropes dragging on the bottom. Some of the areas are recolonizing with algae and *H. stipulacea*.

Some moorings use large rocks, other have three-point moorings which are resulting in large scour areas.

Moving to the east the area becomes intermixed with rocks and cobbles, slowly becoming a mix of emergent pavement with sand channels. At the edge of the pavement there are loose rocks which have scattered corals. As shown in the photograph there are scattered helix anchors which are scattered where they have pulled out of the shallow sand.

The more emergent rocks have been colonized by *Porites porites* and *Agarica agaricites. Orbicella faveolata* is present on scattered rocks and on the pavement to the east.

The largest corals are found on the pieces of rock which have the most vertical relief.

Corals and hard bottom become more abundant to the east. The moorings have been positioned to avoid all corals and all hardbottom areas.

Table 6.06 Species in the project area

Algae	Marina	Wave Attenuator	Mooring Site	Greater Area
Halimeda opuntia	X	X	X	X
Halimeda moline	X	X	X	X
Dictyota pulchella	X	X	X	X
Penicillus captitatus	X	X	X	X
Caulerpa mexicana	X	X	X	X
Laurencia papulosa	X	X	X	X
Galaxaura oblongata			X	X
Jania spp			X	X
Sargassum fluitans	XX		X	X
Halimeda copiosa			X	X
Ventricaria ventricosa			X	X
Wrangelia penicillata	X		X	X
Seagrass				
Thalassia testudinum		X	X	X
Syringodium filiforme		X	X	X
Halodule wrightii		X	X	X
Halophila stipulacea	X	X	X	X
Sponges				
Ircinia compana			X	X
Agelas confera			X	X
Aplysina cauliformis			X	X
Aplysina fulva			X	X
Aplysina insularis			X	X
Desmapsamma anchorata	X	X	X	X
Holopsamma helwigi	X	X	X	X

Neofibularia nolitangere			X	X
Xestospongia muta			X	X
Callispongia vaginalis			X	X
Cinachyrella kuekenthali	X		X	X
Ircinia strobilina	X		X	X
Niphates erecta			X	X
Verongula gigantea			X	X
Callyspongia plicifera			X	X
Monanchora unguifera	X		X	X
Spirastrella spp.	X		X	X
Corals				
Favia fragum			X	X
Siderastrea siderea	X		X	X
Siderastrea radians	X		X	X
Porites astreoides			X	X
Orbicella faveolata			X	X
Gorgonia ventalina			X	X
Meandrina meandrites			X	X
Montastrea cavernosa			X	X
Pseudeodiploria strigosa			X	X
Dichocoenia stokesi	X		X	X
Eusmilia fastiginia			X	X
Agaricia agaricites			X	X
Soft Corals				
Palythoa caribbaeorum	X			
Gorgonia flabellum			X	X
G. marina			X	X
Pseudoplexuara			X	X
Plexuara			X	X
Muricea			X	X
Invertebrates				
Echinometra ***lucunter***	X		X	X
Diadema antillerum	X		X	X

Impact of Construction and Mooring Installation

The construction of the marina expansion will impact the marine environment physically through the placement of piles and sheet piles and could impact water quality through siltation and turbidity during construction, dredging and de-watering of spoils. A water quality monitoring plan will be implemented to monitor control devices and to ensure repairs are made when necessary and additional measures are taken with installed devices are not effective.

The marina and wave attenuator will impact areas that are colonized by algae and *Halophila stipulacea*. The removal of the piling will result in the loss of encrusting sponges and the placement of the new sheetpile wall will impact 12 corals (*Psuedodiploria strigosa* and *Sidereastrea siderea*). The corals will be relocated as part of the mitigation for the project. The mitigation plan is found in Appendix B.

The marina will have a total of 302 pilings, 274 associated the dock structures, 12 mooring piles and 16 pilings associated with the travel lift. These will all disturb areas of algae and *H. stipulacea.* It is probable that each pile will disturb 1.5ft of seafloor due to wave turbulence.

As shown on Proposed Wave Attenuator drawing and the Section H Wave Attenuator drawings the floating breakwater would be installed with either helix anchors. As shown in the benthic habitat map Figure 6.06.8 Benthic Habitat in the Marina Area, the wave attenuator is in an area of Macro-algae and varying degrees *H. stipulacea*. The attenuator is anchored with helix anchors will have a negligible impact during installation, if blocks are placed it will have at most 700ft (0.016 acre) of algal/*H. stipulacea* impact (footprint and turbulence impact). The lines used with be elastic mooring rodes and will have no impact on the seafloor.

The attenuator is 16’ in width and is in approximately 30’ of water and is oriented in a north south orientation which means that during the course of the day the shading of the attenuator will shift, and the area of shading would shift throughout the day and should have no impact on the algae and *H. stipulacea* which is scattered within the area. No seagrass or corals will be impacted by this structure.

The dock will be providing slips for 28 vessels many larger than vessels currently within the area. The marina is designed so that vessels should have adequate depth for maneuvering and there should be minimal suspended sediment. The marina will have fuel service and the system designed has secondary containment, double wall fuel lines and leak detection systems. The marina will have a Terminal Facility License and a Spill Prevention Containment Countermeasure Plan. Fuel supplies will be situated at the main docks as well as on the dinghy dock in the event of inadvertent spills. Fueling of dinghies on the dinghy dock or in the mooring field will be prohibited.

No discharge from vessels at the marina will be allowed and the marina will have a pump out facility.

The moorings have been sited to avoid all hardbottom and corals. Some of the mornings will be in areas of mixed seagrass, and in areas with *H. stipulacea* and algae. The moorings will utilize helix type anchors and floating lines so there will be minimal impact on seagrasses after the moorings are installed. There may be some blade and rhizome lost during installation. Seagrass currently is thriving in the outer bay under vessels in the bay where ropes and anchors are not impacting the seafloor.

The implementation of the managed mooring field with proper moorings and the cleanup of the debris from the seafloor will allow for the recolonization of the damaged areas by sea grasses. Unfortunately, due to the presence of *H. stipulaceae* it may colonize many of the areas which are cleared or no longer swept by lines before *T. testudinum, S. filiforme* or *H. wrightii* can spread into the area.

Vessels are currently moored haphazardly in Vessup Bay. Many have anchoring systems which are damaging the seafloor. A few of the vessels are live-a-boards who simply dump their waste straight into the sea. Some vessels have been allowed to sink on their moorings.

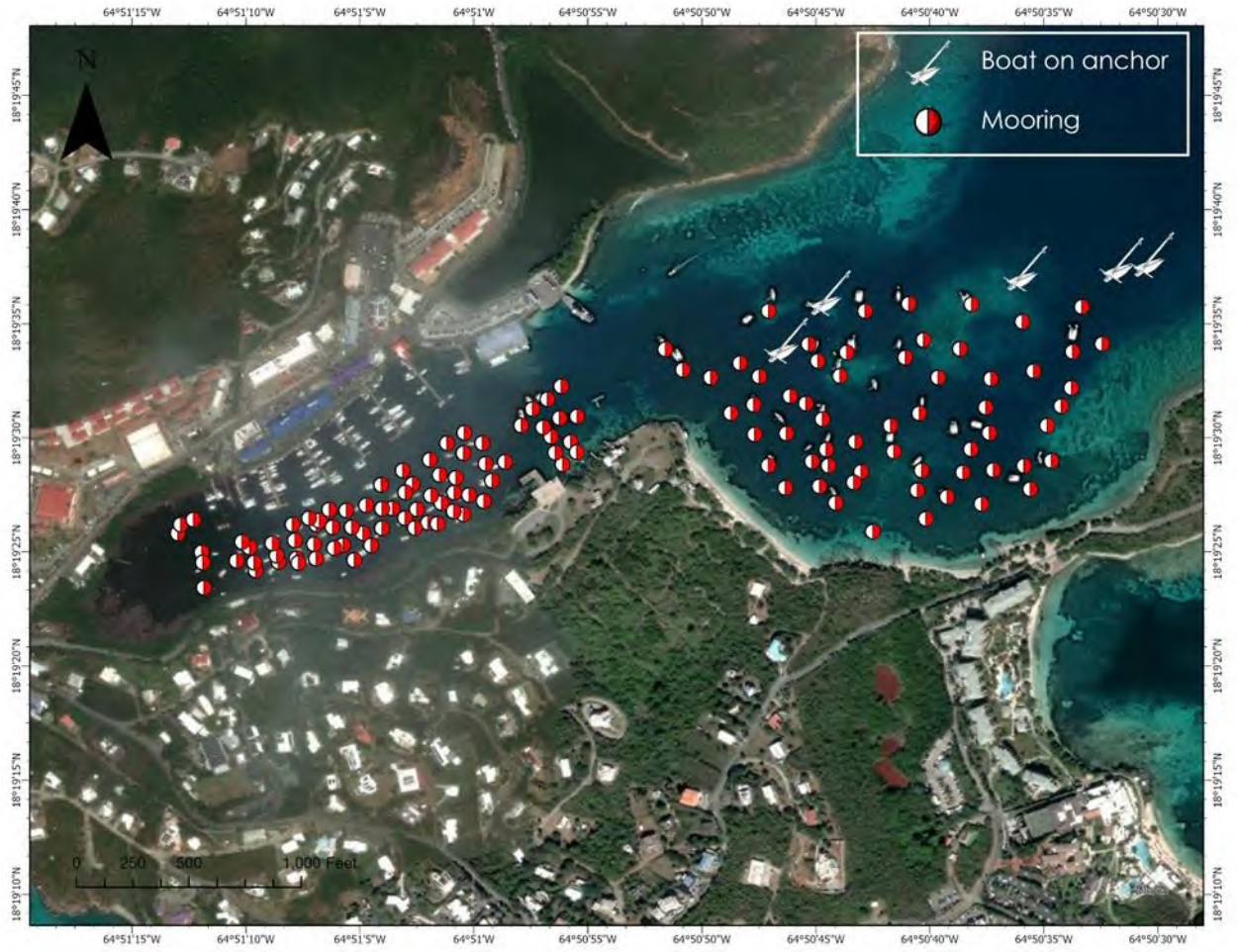


Figure 6.06.3 Vessels mooring and anchoring as of December 5, 2022.

The introduction of a managed mooring field will not only stop many of the ongoing physically damaging things which are occurring, but it should help reduce the nutrient loading by providing pump out service and enforcing it in the managed mooring field.

	Disadvantages	**Advantages**
Comparison Existing Mooring/Anchoring Conditions vs	• mooring buoys installed by individuals • different technical solutions / equipment – weights, engine blocks, rocks, anchors	• Engineered mooring buoys professionally installed • elastic mooring lines that do not impact seabed

Managed Mooring Field Mooring Buoys	• boat anchors and anchorage chains and ropes dragging seabed • short term anchoring • vessels deploying multiple anchors • no moorings available for short-term rental	• Mooring buoys installed and maintained by Management • Short and long-term users have the mooring buoy system available for rent
Water Space Use	• Mooring locations only approximately located • No control on anchoring locations • Limited and unreliable markers • Encroachment into navigation channel • Boats close to the public beach	• Mooring field area with offset to beaches (approximately 300ft) • Mooring field area with offset to navigation channels • Mooring field area markers and mooring buoys precisely located • Additional navigation channel markers • Prohibition to drop anchor • Enforcement by Management
Sewage and Waste Management	• No control of boat discharges • No control over repair activities • Detriment to water quality	• prohibition of discharge of sewage, bilge, oil or solid waste to the bay • sewage pump out • solid waste bins • proper disposal procedures for fluid and solid waste will be available through the marina • Management provides control and enforcement
Upland services	• Some services provided at American Yacht Harbor	• Dinghy docks professionally installed • Dinghy docks maintained and repaired by Management • Restrooms, showers, and laundry • Authorized access to land • Car and bike parking • WIFI

6.07 Terrestrial Resources

The site is highly disturbed, it encompasses the Latitude Marina which has been developed since the 1970's, the old wetland, which was filled in the 1960s, a boat rental area and a highly used beach. The site was almost complete disturbed in 1972. The only undisturbed area is immediately to the north of the access road.

By 1974 there was more development in the subject parcel, the approximate disturbance lines for the Latitude 18 development are shown in red.

The marina was landscaped at one time, but the landscape has been significantly impacted by storm events and is no longer maintained. There are seagrapes (*Cocoloba uvifera*) found along the shoreline and scattered throughout the property. A large Norfolk pine (*Araucaria heterophylla*) in the center of the open yard has died due to the hurricanes of 2017 and a West Indian Almond (*Terminalia catappa*) which is doing poorly. Coconut palms (*Cocos nucifera*) are found along the northern shoreline of the marina are. There are seaside maho (*Thespesia populnea*) intermixed with the seagrapes along the shoreline. Much of the marina site is either mown grass of compacted dirt or gravel. The area immediately around and around the buildings on the southeastern side of the property are overgrown with tan-tan (*Leucaena leucocephala*).

Beach Area/Littoral Woodland

There is a fence separating the marina from the beach area to the southeast. The fence line is overgrown with seaside maho, seagrapes and capers (*Capparis indica*). The boat rental place which is only open on the weekend, has Hobi cats, kayaks, and small sail boats. Amid the trailers are extremely large seaside maho. There are also scattered seagrapes and coconut palms amid the trailers. The area becomes more forested to the west between the trailers and a beach access road and there are several marble trees, (*Cassine xylocarpa*) and a *Jacquinia arborea*, and very dense seaside maho. The beach extends to the southeast and there is a dirt roadway and then parking areas scattered between large seaside maho,

seagrapes and scattered coconut trees. Scattered amid the parking areas and the trees were small patches of seaside lavender (*Argusia gnaphalodes*), beach peavine, and *Cakile lanceolata.*

Inland behind the littoral woodland is the old filled wetland. Buttonwood mangroves (*Conocarpus erectus*) are found scattered within the area, some are quite large and extend above the surrounding canopy which is primarily tantan (*Leucaena leucocephala*), *Solanum sp*, crotons (*Croton* spp), sages (*Lantana* spp), smaller buttonwoods, widely scattered small casha (*Acacia tortuosa*), large *Acacia maracantha*, small *Cocoloba microstachya.* Vines are common in the old wetland including lizard food (Momordica charantia) and beach peavine (*Canavalia rosea*).

Along the roadway into the existing marina and scattered throughout the wooded area in from the road and the dirt track to the beach are caper capers (*Capparis cynophallophora, Capparis flexuosa, Capparis indica*). Spanish bayonet (*Yucca aloifolia*) is common along the roadway and into the edge of the old wetland presumably having been dumped as landscaping debris as well as cactus (*Opuntia dillenii*). Turpinetine trees (*Bursera simaruba*) are found on the fence line of the existing marina and along the roadway. Wild cotton (*Gossypium hirsutum*) is found both along the roadside and in the old wetland area.

The following table lists plant species noted during the terrestrial surveys.
Table 6.07.1

SPECIES	Marina	Beach	Filled Wetland	Roadside
Acacia maracantha			x	
Acacia tortuosa			x	x
Adenanthera pavonina	x			
Araucaria heterophylla				
Argusia gnaphalodes			x	
Bursera simaruba	x		x	x
Cakile lanceolata	x	x	x	x
Canavalia rosea		x	x	
Capparis cynophallophora	x		x	x
Capparis flexuosa			x	
Capparis indica	x		x	x
Cassine xylocarpa		x	x	
Cenchrus incertus	x	x		
Chrysobalanus icaco		x	x	
Citharexylum fruticosum			x	
Coccoloba uvifera	x	x	x	x
Cocoloba microstachya	x	x	x	
Conocarpus erectus	x	x	x	x
Croton betulinus			x	x
Croton discolor			x	
Distichlis spicata	x	x	x	
Erithalis fruticosa			x	x
Eugenia cordata			x	x
Eugenia sessiliflora			x	x
Euphorbia mesembrianthemifolia			x	
Gossypium hirsutum			x	x
Heliotropium curassaruium		x	x	
Ipomoea pes caprae		x		
Jacquinia arborea		x	x	
Jatropha gossypifolia		x	x	
Krugiodendron ferreum		x	x	
Lantana camara			x	x
Lantana invoucrata			x	
Leucaena leucocephala	x	x	x	x

Malpighia linearis			x	x
Momordica charantia			x	
Morinda citrifoli		x		
Opuntia dillenii				x
Pictetia aculeata			x	x
Pyschotria nervosa			x	
Sesuvium portulacastrum		x		
Solanum sp.			x	x
Sporobols virginicus	x	x	x	x
Stigmaphyllon emarginatum			x	
Terminalia catappa	x	x		
Thespesia populnea	x	x	x	
Yucca aloifolia	x			x

Fauna

Deer tracks were noted in the old wetland area. Birds seen on the property outside the cleared marina area include Zenaida dove (*Zenaida aurita*), common ground dove *(Columbina passerina)* and a gray kingbird (*Tyrannus dominicensis*).

Reptiles were abundant and tree anoles (*Anolis cristatellus*), grass anoles (*Anolis pulchellus*), barred anoles (*Anolis stratulus*), dwarf geckos (*Thecadactylus* sp), and common ground lizards (*Sphaerodactylus macrolepis*) were seen within the property boundaries. The St. Thomas tree boa (*Epicrates monensis granti*) is probably present but was not seen during the survey. The site is in its critical habitat.

Impact of Project

Most of the site has been previously disturbed in the past, approximately 95% of the site has been cleared as part of the previous marina development , the sand operation on the site or by the wetland filling more than 50 years ago. Approximately 1.38 Acres of that has been recolonized by opportunistic species and species which could tolerate the saline soils and the remainder has been recolonized by non-salt tolerant species.

The project will clear most of the site. This will be removing primarily tan-tan, buttonwoods, casha, seagrapes, and other species that recolonized the old salt pond area when it was filled. Nearer the shoreline and along the roadway to the existing marina ruin, seaside maho, turpentines, seagrapes, capers, wild cotton, and Spanish bayonets. Large trees will be preserved as part of the landscaping plan and tree boa corridor.

Once the project is complete approximately 1.223 acres of the site will be vegetated. A total of 0.579 acres of the site will become part of the drainage swells and will be set aside for preservation. Trees will be planted along the upper banks of the swells and within the pond where possible. Upon completion of the property 1.208 acres will be landscaped with native trees replanted to provide habitat to tree boas and other species. Approximately 0.7 acres or just over 10% of the site will be suitable tree boa habitat.

To maintain a consistent level of landscape quality year-round, there will be a need to utilize measured amount of fertilizer. Two major components of the plan are an Integrated Pest Management (IPM) program and a Nutrient Management Plan (NMP).

The total irrigation demand for the site will be approximately 7,000 gpd. The reuse water will be pumped through irrigation mains that will be used to supply the irrigation zones on site. The cistern can be supplemented by the potable water system through a valved connection to the site water main (as discussed in the above cistern section). To utilize all the effluent generated during periods of high usage, the irrigation system will be designed to water as much of the undeveloped site as necessary to dispose of the effluent.

The irrigation water will be pumped from the reuse cistern into a looped irrigation distribution system. The irrigation distribution will be controlled through a series of zones that will be set up to ensure that each area of the development does not receive too much or too little water. During times of rain and other times when the cistern becomes too full, the pumping system will pump the excess reuse water into undeveloped areas, or the cistern will overflow into the stormwater collection.

6.09 RARE AND ENDANGERED SPECIES

All three endangered sea turtle species are known to frequent the waters offshore of St. Thomas: Leatherback Sea turtles (*Dermochelys coriacea*), green sea turtles (*Chelonia mydas*) and hawksbill sea turtles (*Eretmochelys imbricata*). Both green and hawksbill turtles have been seen during the numerous surveys in Red Hook Bay over the last 30 years. The offshore seagrass beds and coral reefs are foraging habitats for these species. The site does have a suitable turtle nesting beach which faces Mueller Bay.

The hardbottom in the mooring field is critical habitat to listed coral species. O*rbicella faveolata* is found within the mooring.

The Nassau Grouper (*Epinephelus striatus*) was seen during surveys of the area. The grouper should notbe adversely affected by the dock construction or mooring field installation.

A large Giant Manta Ray (*Manta birostris*) was seen offshore of the southside of Cabrita Point in 2000.

Scalloped Hammerhead (*Sphyma lewini*) and Oceanic Whitetip Shark (*Carcharhinus longimanus*) do not occur within the project area due to its location in Vessup Bay.

The endangered Antillean manatee (*Trichechus manatus manatus*) has recently been seen in the U.S. Virgin Islands after not being seen for many years. No manatees have been reported from this area.

Coastal waters and waters within the Virgin Islands are frequented by whales *(Megaptera novaeangliae, Balaenoptera physalus*) during winter for mating and birthing and dolphins (*Tursiops truncates*) are year-round residents. Dolphins have been frequently seen with Great Bay and whales are occasionally seen in Pillsbury Sound adjacent to Great Bay.

The property is within the designated critical habitat for the St. Thomas Tree Boa (*Epicrates monensis granti* recently reclassified as *Chilabothrus granti*), a federally listed rare and endangered species. Vegetation within the project footprint will be cleared by hand to limit impacts to the tree boas. A tree boa mitigation plan is found in Appendix C the plan incorporates measures from both the Virgin Islands Tree Boa Guidance and FWS's Boa Biological Opinion.

Table 6.09.1. ESA Threatened and Endangered Species Potentially Occurring in the Greater Project Area

Scientific Name	Common Name	Status
Acropora palmata	Elkhorn coral	T
Acropora cervicornis	Staghorn coral	T
Orbicella annularis	Lobbed Star coral	T
Orbicella faveolata	Mountainous star coral	T
Orbicella franksi	Boulder star coral,	
Dendrogyra cylindrus	Pillar coral	T
Mycetophyllia ferox	Rough Cactus Corals	T
Eretmochelys imbricata	Hawksbill sea turtle	E
Dermochelys coriacea	Leatherback sea turtle	E
Chelonia mydas	Green sea turtle	T
Caretta caretta	Loggerhead sea turtle	T
Trichechus manatus manatus	West Indian manatee	E
Megaptera novaeangliae	Humpback whale	E/D^2
Balaenoptera physalus	Finback whale	E
Epinephelus striatus	Nassua grouper	T
Manta birostris	Giant Manta Ray	T
Sphyma lewini	Scalloped Hammerhead	T
Carcharhinus longimanus	Oceanic Whitetip Shark	T

Table 6.09.2 ESA Species Observed in the Action Area

	Morningstar Bay
Species	
ESA Listed	
Acropora palmata	
Acropora cervicornis	
Orbicella franski	
Orbicella annularis	
Orbicella faveolata	X
Mycetophyllia ferox	
Dendrogyra cylindrus	
Eretmochelys imbricata	X
Dermochelys coriacea	
Chelonia mydas	X
Caretta caretta	
Trichechus manatus manatus	
Megaptera novaeangliae	
Balaenoptera physalus	
Epinephelus striatus	X
Manta birostris	
Sphyma lewini	
Carcharhinus longimanus	

Table 6.09.3. Species managed by CFMC occurring in the nearshore area in the Virgin Islands.

Scientific Name	Common Name
Cnidarians	All corals
Strombus gigas	Queen conch
Panulirus argus	Spiny lobster
Epinephelus struiatus	Nassau grouper
E. guttatus	Red hind
E. fulvus	Coney
Ocyurus chrysurus	Yellowtail snapper
Lutjanus analis	Mutton snapper
L. apodus	Schoolmaster
L. gruiseus	Grey snapper

L. vivanus	Silk snapper
Chaetodon striatus	Butterflyfish
Holocentrus ascensionis	Squirrel fish
Haemulon plumieri	White grunt
Balistes vetula	Queen triggerfish
Malacanthus plumieri	Sandtilefish
Sparisoma chrysopterum	Redtail parrotfish
Lactophrys quadricornis	Trunkfish
-	Sharks and Tunas
-	Swordfish and Billfishes

Figure 6.09.1 Critical habitat near the marina.

Impact of Project

The project will have the potential to impact sea turtles, marine mammals, and fish during the driving of piles for the dock due to acoustic impacts and during vessel movements. Most of the piles should be able to be driven by a vibratory hammer. The use of an impact hammer will be minimized as such will create a minimal esonification of the area. As a part of the water quality monitoring plan monitors will monitoring for sea turtles prior to all pile driving to ensure that no sea turtles are within a 500m safety zone. If a sea turtle or marine mammal ventures into the safety zone work will stop until such time the sea turtle leaves the area of its own volition. Sea turtle monitoring is discussed in the Water Quality Monitoring Plan The adjacent beach is an active sea turtle nesting beach and as such seaturtle friendly lighting and vegetative screening will be utilized to prevent light impacts on the adjacentbeach.

In addition, the Standard Construction Conditions established for the sea turtles by the National Marine Fisheries Service and Vessel Strike Avoidance Measures and Reporting for Mariners will be implemented during the project construction and are attached for reference in Appendix E. This will also protect the West Indian Manatee (*Trichechus manatus*), while not usually present in the USVI, two have been seen in St. Croix in 2018 and one has been seen in St. John during the fall of 2022.

The marine habitats around the proposed mooring field have coral and seagrass resources. There is an ESA listed corals species near the proposed mooring field. *Orbicella faveolata* are located within the proposed moorings. The closest ESA species is located 25ft from the closest mooring. The contractor will be made aware of the coral locations so that they can be avoided. The corals should not be impacted by dock construction or use.

Double turbidity barriers will be deployed, and water quality monitored will be conducted during all in water work. Turbidity barriers will not be opened or removed until interior water quality has settled to acceptable levels. Turbidity barriers will be removed or secured when not in use to limit impact to the surrounding benthos. If turbidity control is properly maintained and monitored the impacts should be minimal.

Vegetation within the project footprint will be cleared by hand to limit impacts to the tree boas. The tree boa mitigation plan is found in Appendix C. The berms and portions of the basin for the stormwater basin will be planted with trees to provide additional habitat for tree boas. A corridor with interdigitation will be planted along the southern border of the property, upon completion of the project approximately 0.7acres or approximately 10% of the project area will be suitable tree boa habitat and the sediment pond and surrounding area will be preserved as boa habitat.

6.10 Air Quality

All of St. John and St. Thomas is designated Class II by the Environmental Protection Agency in compliance with National Ambient Air Quality Standards. In Class II air quality regions, the following air pollutants are regulated: open burning, visible air
contaminants, particulate matter emissions, volatile petroleum products, sulfur compounds, and internal combustion engine exhaust (Virgin Islands Code Rules and Regulations).

There will be a slight increase in air emissions during the use of heavy equipment for pile socketing/vibra-hammering. Once the dock is completed, air quality will be impacted by the periodic vessel visitations. The dock will have a negligible impact on air quality.

7.00 IMPACTS ON THE HUMAN ENVIRONMENT
7.01 Land and Water Use Plans

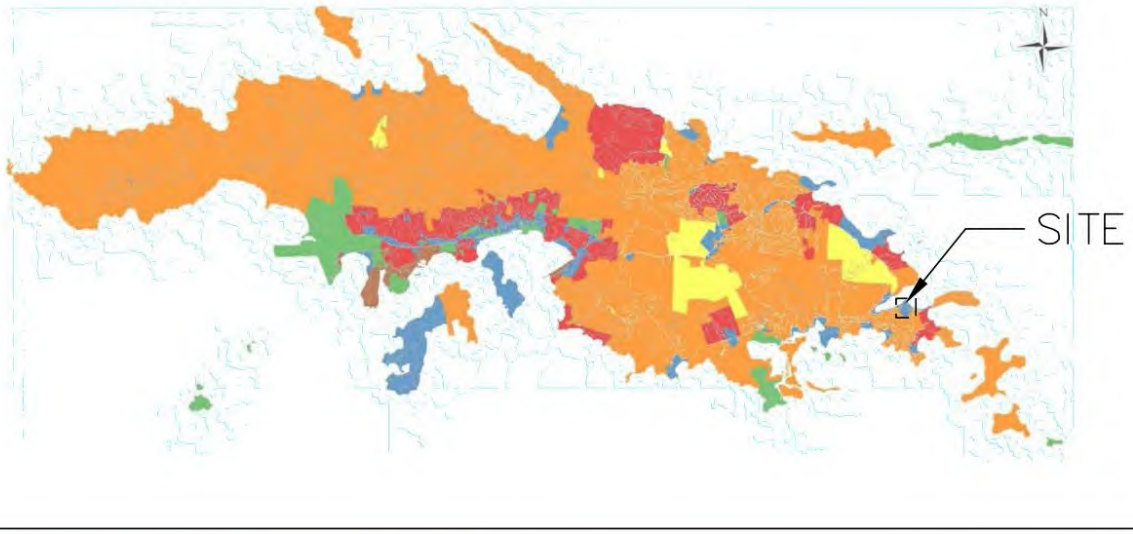
The property is zoned W-1, Waterfront – Pleasure Zone. The project components are allowed as a Right-of-Use;

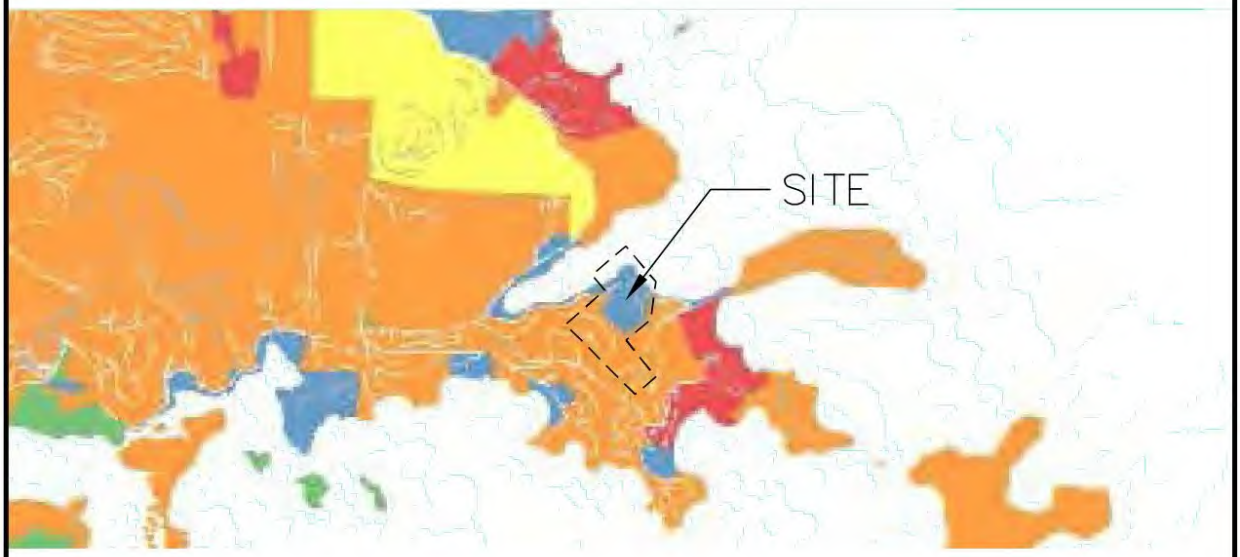
“20. Dwellings, 27. Marinas (Recreational Marine Crafts), Charter & Rentals, Boat Access Sites, Boathouses (Storage), 40. Restaurants, 42. Sewage Lift & Pressure Control Station, and 43. Sewage Treatment Plants. Uses permitted subject to the conditions set forth in sections 231 and 232 of Chapter 3. Virgin Islands Zoning and Subdivision Law: 1. Apartment Houses, Hotels and Guesthouses (Dwelling, Multi-Family). Accessory uses permitted subject to the conditions set forth in section 233 of Chapter 3. Virgin Islands Zoning and Subdivision Law: 1. Accessory Buildings (Structures).”

A specific flushing study was conducted to determine the project design that will cause no negative impact to circulation in Vessup Bay. In addition to showing no negative impact, the proposed mooring

field management includes the installation of a sewage pump out station and the enforcement of no-discharge requirements within the mooring field, which should improve water quality in Vessup Bay.

All activities are allowable uses under the existing zoning, W-1. Furthermore, the site has been used as a marina, for boat storage and boat repair since the marina was developed.





Parcel Zoning Type

- Agriculture
- Business/Commercial
- Industrial
- Low Density Residential
- Med./High Density Residential
- Public
- Other (Roads/Cay)

HARRIS Harris Civil Engineers, LLC 1200 Hillcrest Street Suite 200 Orlando, Florida 32803	LATITUDE 18 OFFICIAL ZONING MAP REFERENCE: SECTION 5.02	SECTION 7.01.1

7.02 Visual Impact

The proposed project will be a substantial improvement visually on the existing property. Presently, the Latitude 18 development consists of a wood framed ruin damaged from Hurricanes Irma and Maria in 2017. The existing marina layout has also been severely damaged over the past 25 years by the major hurricanes starting with Hurricane Marilyn in 1995 and culminating with Hurricanes Irma and Maria. The proposed wet slip Marina will for the most part be aligned with the layout of the original Latitude 18 Marina. The Restaurant & Marina Services Building is the cornerstone of the upland development. it is located on the Northeast Promontory of the site. This location forms the southern entry point to Red Hook Bay. The overall structure will be one and a half stories in height with a total square footage of approximately 10,000 SF. The Warehouse Building will be 10,000 SF in size. It will be a single-story structure that will contain storge of materials and supplies related to the operation of the Marina. The axonometric views shown below provide a visual representation of the project once complete.

In order to ensure that the view corridor from East Wind Condominiums is maintained the site plan has been revised.

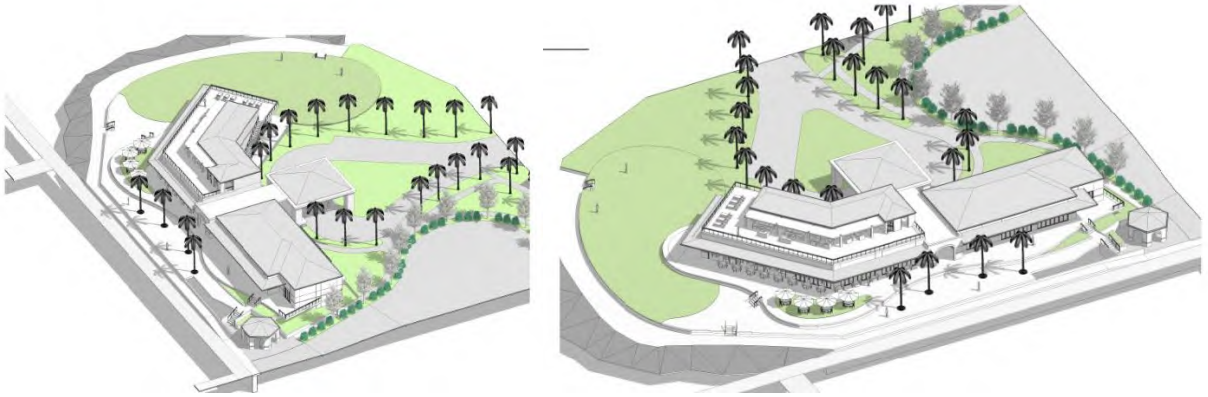


Figure 7.02.1 The Restaurant and Marina Services Building

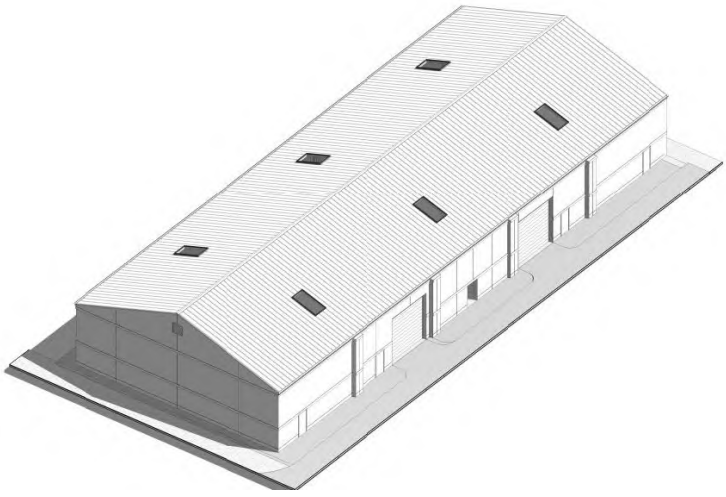


Figure 7.02.2 Axonometric Warehouse Building View

Figure 7.02.3 View from adjoining property.

As such, the visual impact of the new Marina will be like that of the historic layout. The managed morning field will not substantially increase the number of vessels within the bay but will have a very positive impact visually on water quality.

7.03 Impact on Public Services

7.03a Water

The potable water for the site will be supplied by roof catchment and reverse osmosis. The water will be stored in a potable &fire water cistern located within the back of house area underneath the warehouse building. It will be pumped into the on-site distribution system which has been sized to adequately handle the fire demand and the maximum daily demand for the site.

A potable water connection will also be provided to the reuse cistern. This connection is meant to provide supplemental irrigation volume in the scenario that the reuse cistern runs empty.

In severe cases where the potable water volume of the cistern would be low, water would be trucked in from a local distributor.

<u>Demands</u>

The potable water system has been designed to meet the demands for all of the site usages. These elements include a marina facility with retail shops, restaurants & bars, recreational areas, a BOH support building, and miscellaneous usages. Table 7.03-1 is a breakdown of the total demands.

Label	Usage	Units	Unit Flow Rates	Total Flow Rates	Notes
A	Marina Facilities & Retail	2,734 Ft^2 Bld.	0.25 gal/day/Ft^2	684 gal/day	
B	Restautant & Bar	140 Seats	25 gal/day/Seat	3,500 gal/day	Seats
C	Back of House & Support	9,650 Ft^2 Bld.	0.25 gal/day/Ft^2	2,413 gal/day	
D	External Areas & Parking	4,500 Ft^2	0.15 gal/day/Ft^2	675 gal/day	
E	Marina Slips(1)	28 Slips	500 gal/day/Slip	14,000 gal/day	Slips
	TOTAL AVERAGE DAILY FLOW			21,271 **gal/day**	
	MAX DAY FLOW (ADF x 2)			**42,542 gal/day**	
	PEAKING FACTOR			2.5	
	PEAK FLOW RATE			**36.9 gpm**	

Notes:
(1) Actual count varies depending on operational decisions

Table 7.03-1: Summary of Potable Water Demands

The fire demand for the site is the sum of the fire hydrant and sprinkler demands and is based on the site plan in conjunction with the ISO method for required fire flow. The fire hydrant demand will be approximately 1,000 gpm for two (2) hours

Potable & Fire Water Cistern

The total minimum volume of the final potable water cistern will be equal to three days of full project (after build-out) average daily flow plus a volume equal to the amount of fire sprinkler and hydrant demand required to fight a single building fire. The total anticipated potable cistern volume required is approximately 186,000 gallons (21,271 GPD system average daily demand times three, days plus 120,000 gal for fire flow requirements [rounded up]).

A 186,000-gallon potable water cistern will be constructed in the BOH area. This cistern will be the reservoir for the potable water demands for plus fire demands. A water supply main with a backflow preventer assembly will be constructed from the cistern to the site distribution system.

Table 7.03-2: Potable & Fire Water Cistern Sizing

Potable & Fire Water Cistern Size		
Three (3) Day Potable Water Storage Volume	63,813	gal
Fire Flow Volume (1000 gpm @ 2hr)	120,000	gal
Total Potable/Fire Cistern Storage Volume	**183,813**	**gal**

Potable & Fire Water Cistern Dimensions		
Required Volume	183,813	gal
Required Volume	24,574	cubic feet
Height	8	feet
Length	60	feet
Width	52	feet
Provided Volume	**186,701**	**gal**
Provided Volume	**24,960**	**cubic feet**

The total roof area for the project at build-out will be approximately 15,780 SF. The following table is a breakdown of preliminary roof areas.

Table 7.03-3: Summary of Building Roof Areas

Label	Usage	Gross Area (SF)	Gross Area (Acres)
A	Marina Facilities & Retail	6,180	0.14
B	Back of House & Support (1)	9,600	0.22
	TOTAL	**15,780**	**0.36**

Notes:
(1) Roof area discharged directly into irrigation cistern below the building.

The supply water from the BOH building roof runoff will enter the reuse water cistern and will be pumped throughout the site reuse water distribution system.

Potable Water Distribution System

The potable water will be pumped from the cistern into a common potable water and fire suppression distribution system.

The pumping system will include four pumps. A small (jockey pump) will maintain the system pressure during the low flow periods during the day. When the demand increases beyond the capabilities of the jockey pump, a larger potable water pump will become operable. The fire pumping system will have separate pumps from the potable supply pumps. This system will include two pumps (one for redundancy) as well as separate and backup power supplies.

As an alternative to the two-pump potable system, a variable frequency drive control could be used with a single potable pump. The pumps will be manifolded into common suction and discharge headers. The pump manifolding system will be designed so that future pumps may be added to the system if future site development demands it. Cistern level controls will be set to ensure that there is always adequate fire volume in the potable water cistern.

The water main distribution system will be looped around the development. It has been sized to provide adequate pressure during a period of maximum day flow (two times the average daily flow) plus the fire demand (1,000gpm). At each point of connection with the buildings, the potable water will pass through a reduced pressure backflow prevention device. The backflow prevention devices are necessary to prevent possible contamination of the site's potable water distribution system from chemicals and/or stale water present in the fire system.

The water main system will be complete with properly located fire hydrants.

7.04 Social Impacts

Representatives of Latitude 18 have been reaching out to public organizations, yacht charter companies as well as members of the public so that we may hear their concerns and find ways to address those concerns.

The charter companies and organizations have been very receptive and show interest with working with Latitude 18.

7.10 Potential Adverse Effects Which Cannot Be Avoided

The project area will be altered during its use by the addition of a temporary construction office. The site will also be altered during the clearing and access preparation for the geotechnical drilling. There will be some unavoidable adverse effects due to the development of the site. They include:

- Site preparation and land shaping activities;
- Erosion during construction;
- Increased stormwater run-off;
- Increase in noise (especially during construction);
- Increase in traffic on this part of the island;
- Increase is boat activity within the marina; and
- Increased visitors on the beach.

The major adverse effects will involve site preparation and excavation for the roadways, buildings marina, and back-of-house area. These activities will involve removal of vegetation and grading of the site. During construction, the possibility of increased erosion exists. To minimize this erosion, measures will be taken as described in the above sections 5.01c-g and 6.03. After construction, all areas which remain exposed will be landscaped for permanent stabilization of the soils.

Another adverse effect will include the increase in stormwater runoff from the site. Measures will be taken to ensure that this adverse effect will be kept to a minimum. The pre-construction overland flow

patterns will be changed as little as possible, and measures will be taken to capture and clean stormwater run-off from the new impervious surfaces. A stormwater retention pond will be constructed to provide water quality treatment and attenuation prior to discharging into the nearby bay.

This project will cause an increase in the noise level of the area. Construction noise levels will be high (as is the nature of this type of construction). Car noise and ambient noises (i.e. music, workers, gatherings of people, etc.) will also contribute to the raised noise level. The topography of the site will direct sound primarily toward the bay. Thus, the increase noise from the site should have a minimal on local residents.

The construction of the marina expansion will impact the marine environment physically through the placement of piles and sheet piles and could impact water quality through siltation and turbidity during construction, dredging and de-watering of spoils. A water quality monitoring plan will be implemented to monitor control devices and to ensure repairs are made when necessary and additional measures are taken with installed devices are not effective.

The marina and wave attenuator will impact areas that are colonized by algae and *Halophila stipulacea*. The removal of the piling will result in the loss of encrusting sponges and the placement of the new sheetpile wall will impact 12 corals (*Psuedodiploria strigosa* and *Sidereastrea siderea*). The corals willbe relocated as part of the mitigation for the project. The mitigation plan is found in Appendix B.

The marina will have a total of 302 pilings, 274 associated the dock structures, 12 mooring piles and 16 pilings associated with the travel lift. These will all disturb areas of algae and *H. stipulacea.* It is probable that each pile will disturb 1.5ft of seafloor due to wave turbulence.

As shown on Proposed Wave Attenuator drawing and the Section H Wave Attenuator drawings the floating breakwater would be installed with either helix. As shown in the benthic habitat map Figure 6.06.8 Benthic Habitat in the Marina Area, the wave attenuator is in an area of Macro-algae and varying degrees *H. stipulacea*. The attenuator is anchored with helix anchors will have a negligible impact during installation. The lines used with be elastic mooring rodes and will have no impact on the seafloor.

8.00 Mitigation Plans

To abate and minimize environmental impacts the following mitigation and monitoring plans are proposed.

Mitigation Plan - Appendix B
Water Quality Monitoring Plan and Sea Turtle Protection Plan - Appendix B
Revised Tree Boa Protection Plan - Appendix C

9.00 Alternatives to Proposed Action

These impacts are unavoidable for the development of a marina and were minimized by design or mitigated, as follows:

- The proposed design seeks to reduce the number of piles by avoiding the use of mooring piles between slips and by using partial length finger piers. The previous marina had dock pier structural piles and mooring piles between each slip.

- The proposed water depths near the bulkhead were reduced to only accommodate smaller draft vessels, as opposed to the ideal design depth to maximize the marina efficiency, to reduce the seabed impact. The required water depth for mono-hull yachts of the size envisioned requires -8 ft msl water depth, which resulted in a 18,325 sq ft area impact and 2,260 cy of material to be removed from the seabed. An alternative was proposed to locate catamarans in those slips and providing a design depth of -12 ft msl. The area of dredging has increased and a total of 7200cubic yards will be dredged to a depth of 12ft from an area of approximately 5 acres (219,268sf).
- The floating wave attenuator performance to reduce agitation is driven by the structure width. Wider floating elements provide more wave attenuation than narrower ones. The structure is intrinsically massive and opaque. The only impact reduction strategy available is to design the attenuator with the minimum width that serves the required function. Grated decking for light floating element structural solutions were explored. The actual seabed impact is ultimately minor because the water depth is on the order of 20ft.

- All mooring buoys will be anchored to the seabed by drilled anchors and connected to the buoy bollard with elastic rods. This mooring buoy design solution avoids seabed impacts during operation. Alternative anchorage systems, such as anchor and chain which is common in this area at present, and boat anchors typically cause significant seabed damage, as documented in this section

Wave panel analysis of alternatives – significant reduction of circulation if wave panels used all along the dock

No managed mooring field - larger seabed impact, no control on boat discharges, less navigation safety due to uncontrolled anchorage in navigation channel.

Managed mooring fields were proposed for both Vessup and Muller. The mooring field in Vessup Bay has been removed.

A detailed survey was done throughout the project area and ESA corals were located and moorings are proposed with avoid corals and hardbottom.

Project Study and Analysis of Alternative wave Screen Layouts

Due to the sensitive nature of the water quality in Vessup Bay, a detailed study was undertaken to evaluate potential project impacts. While the pile supported fixed pier dock causes negligible impact circulation, the proposed wave screen panels can block circulation.

A calibrated circulation model was set up and calibrated with field measurements and tested for a variety of alternative layouts of the wave panels:
Base Condition – no structures

Design condition - gap of 70 feet between the shoreline and the wave protection structure
Alternative 1 – wave panels connecting to the shoreline
Alternative 2 – gap of 23 feet between the shoreline and the wave protection structure
Alternative 3 - gap of 46 feet between the shoreline and the wave protection structure

Figure 9.00.1: Proposed Marina Location and Wave Protection Structure (Design Condition)

Initially, the design looked to extend the wave barrier perpendicular to the shoreline up to the shoreline in order to provide the maximum protection (Alternative 1). Initial flushing simulation results showed that this would significantly increase the overall flushing times within Vessup Bay. Two other alternatives were run. The first had a gap of 23 feet between the shoreline and the wave protection structure (Alternative 2). The second had a gap of 46 feet (Alternative 3). The runs with a gap of 70 feet was shown to have no negative impact on circulation.

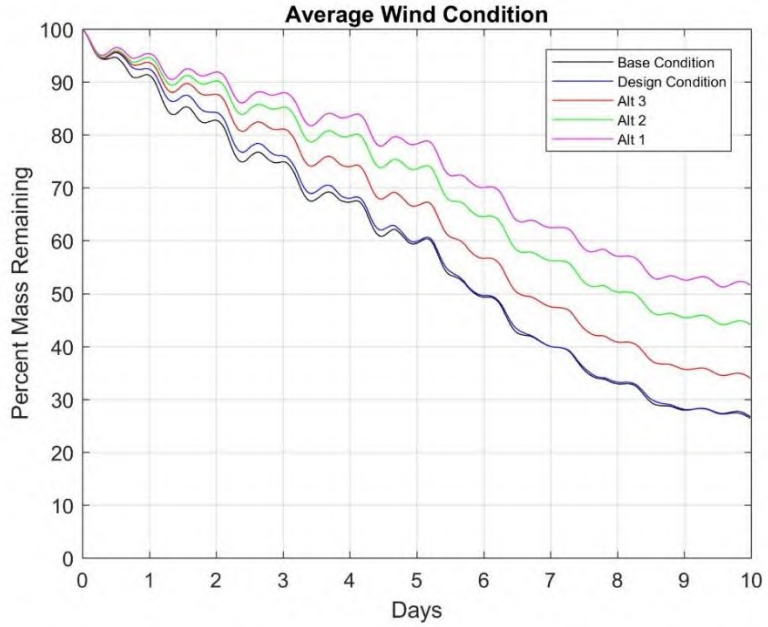


Figure 9.002: Comparison of the Percent Mass Remaining for the Alternatives, the Design Condition and the Baseline Condition under Average Wind Conditions

From the point of view of flushing Vessup Bay, the project achieved no negative impact by locating wave panels in a way that do not obstruct circulation, as demonstrated by the results of a calibrated flushing model.

Moreover, by providing management of boat discharges as part of the Managed Mooring Field management plan (Appendix B) the project is seeking a net positive impact on the water quality.

A detailed survey was done throughout the project area and ESA corals were mapped and moorings were located to avoid corals and hardbottoms.

Appendix A

Marina Hurricane Preparation Guidelines

Contents

Name: Latitude 18 Marina
Address:
Phone:
Fax:
E-mail:

Latitude:
Longitude:
Water Body:
Permit No.:
SL Lease No.: _____

Hurricane Preparation Guidelines

1 Introduction

This section is not intended to be a comprehensive hurricane preparedness plan, but to outline considerations that should be included in the plan.

The marina management (includes both marina dockage and mooring fields) will establish a hurricane preparation plan, which shall be designed to ensure that protecting the lives and safety of boaters and staff is the priority. These guidelines are intended to also prevent catastrophic failure of the marina water structures, to minimize major structural damage to the marina, and to prevent boat damages.

2 Design Approach

Marina docking structures are subject to substantially larger forces when boats are on their slips, compared to an empty slip condition. Due to the marina exposure, it will be required that all wet berthing and mooring buoys be evacuated in preparation for a tropical storm or hurricane.

2.1 Marina and Mooring Field Elements

It has been shown in the past that the lack of knowledge by boat owners and marina managers of the marina design assumptions may result in wrong decisions that may lead to severe damage to property. This section is intended to summarize the design criteria and emphasize the need for evacuation.

The marina berthing infrastructure is primarily comprised of concrete fixed docks, with only the dinghy docks being floating docks. The marina also includes a floating wave attenuator, which will be designed to improve boaters' comfort under operational conditions but will not be designed to provide wave protection during tropical storm or more severe conditions.

2.2 Hurricane Regulations

This marina is not considered a "hurricane hole." Therefore, the marina and mooring field facility structures will be designed to be empty during a hurricane event. Boat owners should accept this condition as part of their lease contract and are responsible for taking any necessary precautions so that boats are removed from the facility before a hurricane.

Specific procedures shall be defined in a hurricane management plan and the slip or mooring lease agreement.

2.3 Engineering Design Background

The wave design condition will be defined as an event with a 25- to 50-year return period, in accordance with standard professional practice. Performance specifications will require that the docks and structures be designed to withstand wind and wave forces created by these conditions in an unloaded scenario, that is, with no vessels moored in the basin during these conditions.

The fixed docks main structural components will be designed to survive a major storm. However, utilities, furniture and ancillary elements may be damaged due to splashing, wave impacts and inundation, depending on the storm severity.

The mooring buoys will be designed to be evacuated, but the dinghy docks may be damaged depending on the storm severity.

The floating wave attenuator will be designed to be removed in preparation for a storm and/or on a schedule (within the hurricane season).

3 Evacuation and Hurricane Storage

While the marina will try to facilitate planning for the relocation of vessels with a marina lease agreement, Marina Management is not responsible for finding a relocation place for these vessels.

The marina may offer a "Hurricane Club" membership that includes relocation and storage services for marina tenants.

- The Marina Management may – at its sole discretion – develop a plan for relocating vessels to a nearby hurricane hole. If offered, this service will include securing space at the hurricane hole and establishing the staff requirements to achieve the relocation. This service will be offered to marina tenants prior to the initiation of hurricane season but may be limited by the ability to secure safe relocation spots. This is only to assist vessels owners in the compliance with lease contract requirements but is not required.
- The Marina Management will offer upland storage for certain size vessels, under specific commercial agreements. This service will be offered to marina tenants prior to the initiation of hurricane season.

Boats tend to suffer less damage if they are stored on the upland. Upland storage capabilities will be determined by the Marina Management based on equipment and storage areas available on an annual basis.

The Marina Management will develop a plan in advance for the boats that shall be stored on land, based on the contracted services.

4 General Hurricane Preparation

The plan should consider users and staff, as well as the boats, docks, buildings, office, and office supplies. Protecting the lives and safety of boaters and staff is the priority of the plan.

4.1 General Staffing

- Designate hurricane team, staff members, roles, responsibilities

- Prepare training material to maintain staff aware of their roles

4.2 Communications

Cooperation from boat owners is essential:

- Marina contracts shall include explicitly the boat owners' responsibilities in the event of a hurricane.
- Every effort to provide boat owners with a convenient way to comply with their contractual requirements will greatly facilitate cooperation.
- Specific hurricane preparation requirements should be written down now so that they can be posted on the marina's website, in addition to in the contracts.
- Updated records should be maintained for contacts, owner and alternative person(s) who can prepare the boat in the owner's absence. This will allow owners to contact someone else, in the event that he or she will not be able to prepare their own boats.
- Marina contracts shall specify that an owner will be billed for any services necessary to prepare a boat in their absence.
- The marina workboats should be included in the preparation plan.
- A list of nearby hurricane holes should be developed, in coordination with Emergency Response, and posted on the marina website.

4.3 Documents

- Maintain updated information about insurance, coverage, requirements, etc.
- Make duplicate copies of important documents, e.g., insurance policies, financial records, vendor list, etc.
- Routinely back up all computer office files.
- Take photos of facilities, inventory, machinery and valuable tools for insurance purposes.
- Make laminated photo ID tags to give to the Hurricane Team. This may help to get staff access into restricted areas after the hurricane.

4.4 Supplies

- Consider what gear is essential to preparing the marina for a hurricane. Examples include smaller emergency generators, plywood, and nails, all of which will be in short supply once a warning is posted.
- Have enough jack stands to support boats stored on land during a storm. Additional stands and tie down will be required.
- Determine other necessary equipment, including flashlights, communication radios, batteries, pumps, yellow caution tape, extra fuel, duct tape, boat hooks, water, drinks and food. The latter can be used to feed staff during clean up after a storm.

4.5 Recovery Preparation

- Maintain contact information and communications with boat salvors.
- Maintain contact information and communications with engineers, equipment suppliers and/or building and marine contractors.
- Making arrangements in advance allows for quick response after the storm.

5 Tropical Storm Preparation Plan Outline

This plan will be triggered by the issuance of tropical cyclone advisory that has potential of affecting the facility or its operations.

Tropical storm or hurricane watch declaration, which is an announcement that tropical storm or hurricane conditions are possible within the specified coastal area within 48 hours, will trigger additional specific actions.

The plan shall provide adequate time for any boat owners and staff to conduct preparation and seek shelter. The procedures listed below shall be considered a guide, are not all inclusive, and shall be followed when and where practicable:

The following time line should be used whenever practical:

5.1 72 hours out:

This plan will be triggered by the issuance of tropical cyclone advisory that has potential of affecting the facility or its operations, which is prior to the official storm warning.

- **Communications**
  - Monitor hurricane track and alert employees of pending storm.
  - Post updated storm information outside the main office and on the website.
  - Inform vessel owners of hurricane preparation and evacuation plans
  - Encourage transients to relocate
  - Check business disaster plan for up-to-date phone numbers.
  - Remind employees of the need for them to have family disaster plans.
  - Review company plan with employees.
  - Check on availability of work force based on vacations and equipment based on operability.
  - Pay close attention to local TV and radio broadcasts
  - Call/ take calls from owners. Complete as many special instructions as possible.
  - Update inventory list of all business equipment and furniture.
  - Evaluate machines and machinery.
  - Allow all employees to take care of personal needs, supplies, food, shutters, etc.
  - Check stock bottled water and ice.
- **Dock and Boats Preparation**
  - Trigger floating attenuator preparation / relocation plan
  - Trigger “Hurricane Club” planning verifications (number of boats, haul out capacity, staffing, etc.)
- **Fuel**
  - Secure fuel supplies to:
    - Top off fuel tanks.
    - Top off fuel in all machinery.
    - Top off generators with fuel, test and service under load.
    - Top off fuel in all vehicles and maintain at full or near full level. Fill spare containers.
- **Wind Preparation**
  - Remove any loose materials from the roof.
  - Remove all flags, banners and signs.

- Quick check of tree risks. Note that trimming or any hurricane yard work shall be completed prior to hurricane season.

5.2 Tropical Storm / Hurricane Watch Declaration, 48 hours out:

- **Communications**
  - Submit evacuation plan notices and follow up to enforce compliance
  - Recheck team member list and contacts.
  - Move all hazardous materials to a safer location on high ground.
  - Videotape or photograph interior and exterior of your buildings.
  - Place loose papers, books, hanging plants in desk drawers or storage cabinets.
  - Change batteries in cell phones, radios, flashlights, etc.
- **Dock and Boats Preparation**
  - Dismantle floating attenuator and safely store in the designated upland area
  - Relocate "Hurricane Club" member boats to designated upland storage area
  - Relocate "Hurricane Club" member boats to off-site hurricane hole (if that service is provided)
  - Enforce evacuation plan notices
  - Secure dock utility equipment
- **Wind Preparation**
  - Remove canvas covers from tents.
  - Move all outside trash cans and any other moveable items to interior.
  - Tie down dumpsters and other items that cannot be brought inside.
- **Office Preparation**
  - Install shutters and building hurricane protection, as needed
  - Check all emergency equipment (flashlights, first aid kits, etc.) Replace missing or faulty items.
  - Move merchandise, equipment, and furniture away from windows and sky lights.
  - Take down pictures and plaques from the walls.
  - Make arrangements to pay employees with cash, if necessary.
  - Set up a petty cash fund for emergency purchases.
  - Alert suppliers of closing.

5.3 Tropical Storm / Hurricane Warning Declaration, 36 hours out:

- All actions should be monitored to ensure compliance with the plan and emergency measures should be initiated as soon as feasible.

5.4 The Hurricane or Emergency, 24 hours out (or before):

- **Dock and Boats Preparation**
  - Verify floating attenuator storage and finalize securing
  - Verify "Hurricane Club" boat upland storage
  - Shut off all marina utilities.
  - Remove any boat in violation of the evacuation plan

- **Office Preparation**
  - Move all remaining records away from windows and floors. Place on shelves, file cabinets and/or counter tops.
  - Relocate boxes, computers and other office equipment if possible to the innermost portion of the building or to a designated offsite safe place.
  - Complete installation of shutters over doors and windows.
  - If possible, forward work numbers to answering service outside hurricane alert area.
  - Notify local authorities if building will be vacant and if a guard/ security will be present.
  - Check standby electrical generator switches and controls for automatic switch over.
  - Disconnect all electrical appliances/ equipment that are not to run on emergency generator.
  - Post "Notice of Closing" at front entry and entry for supply deliveries.
  - Post evacuation map showing major roadways to evacuate area and locations of local hurricane or emergency shelters.
  - Lock all doors when leaving.

5.5 Operations Restart / Hurricane Recovery

- Photo document damage for insurance purposes. If possible, contact your insurer.
- Rig oil containment booms around all sunken boats.
- Contact engineers, equipment suppliers and/or contractors needed to rebuild / repair.
- Determine safe conditions to initiate clean up and when/if volunteers will be allowed access.
- Begin debris clean up. Make two piles—debris that is reusable and debris that will be hauled away.
- Boat owners may volunteer to help clean up. Prepare to support their activities by having availability of food, water, restrooms, etc.
- Keep customers and suppliers apprised of your rebuilding schedule.

Muller Bay Managed Mooring Field
Management Plan
DRAFT OUTLINE

1.0 INTENT OF MANAGEMENT PLAN

This Management Plan (Plan) provides the framework for operation and use of the proposed Muller Bay Managed Mooring Field (Facility) for xx vessels preempting xxxxx square feet in Muller Bay. The provisions of this Plan relate to the entire Facility, including the buoys, associated dinghy dock for access to the upland support facility amenities, and upland support facility amenities. Since the dinghy dock and upland facilities are part of the Latitude 18 Marina, when in conflict, marina management provisions shall have priority.

The provisions in this Plan apply to any vessels, owners, crew, guests, or any other persons entering the Facility. Failure to comply with the Facility Rules and Regulations in this Plan and shall be sufficient grounds for ejection from the Facility and/or legal action. Furthermore, failure to comply with the Facility Rules and Regulations in this Plan may constitute a violation of CZM Regulations and/or Local Ordinances. .

2.0 FACILITY RULES AND REGULATIONS

2.1 Mooring Field Operations Manager (Harbormaster)

The Harbormaster shall enforce the provisions of all permits granted for the Facility. The Harbormaster shall assign each vessel to a mooring. No vessel shall occupy any mooring without the approval of the Harbormaster. The transfer of vessels from one mooring to another must be authorized by the Harbormaster. Approaching vessels shall raise the Harbormaster on VHF Channel 16 or by phone at [XX] for assignment to a temporary mooring until all paperwork has been completed and the Harbormaster assigns that vessel to a mooring for the duration of the stay. Berthing in the Latitude 18 marina or anchoring inside of the marked boundaries of the facility or within 100' outside of the marked boundaries is prohibited unless approved by the Harbormaster. For safety, security, or other management considerations the Harbormaster may move or relocate any vessel from one mooring to any other mooring at the sole discretion of the Harbormaster.

Any violation of these Rules and Regulations may void the Mooring Rental Agreement and/or result in the ejection of the vessel from the Facility, as well as the forfeiture of any part or all of the security deposit, at the sole discretion of the Harbormaster. The interpretation of these Rules and Regulations is the responsibility of the Harbormaster. Appeals thereof may be made to the xxx Commission.

2.2 Operational Vessels Only

Only vessels in compliance with the United States Coast Guard (USCG) environmental and safety standards and Chapter 327 of Florida Statutes, are authorized to moor at the Facility. Only vessels in good operational condition, capable of maneuvering under their own power, and with

current registration or documentation are authorized to moor at the Facility. The determination of whether a vessel is in good operational condition is the sole discretion of the Harbormaster. Vessels without integral or functional power for propulsion are prohibited from mooring at the Facility.

2.3 Vessel Equipment Requirements

All vessels should have a dinghy or other small craft as an alternate means of conveyance to enable access to the dinghy dock and Harbormaster's Office. In the absence of a dinghy, the vessel owner shall inform the Harbormaster at the time of entry into the Facility. The lack of a dinghy shall not be cause to refuse the rental of a mooring. The Harbormaster may allow the use of a Facility dinghy for the vessel occupants to access the upland property, if the Harbormaster has such a dinghy and it is available, and on the condition that the use of that dinghy is and remains at the sole risk of the user. It is the sole responsibility of vessel occupants to provide their own conveyance to the upland facilities. The Harbormaster is under any obligation to own, operate, or maintain a dinghy for the exclusive use of mooring patrons.

2.4 Commercial Use of Moorings

Commercial activities and vessels engaged in commercial activities shall be identified in the rental agreement. Commercial activities for new vessels after one year of initiation of operations may be restricted by the Harbormaster due to operational requirements. However, this does not prohibit commercial vessels from using the Facility or its amenities.
No advertising or soliciting shall be authorized on any vessel within the Facility, with the exception of "for sale " signs not to exceed two (2) square feet in size. Each vessel shall be limited to a maximum of two (2) such signs.

2.5 Mooring of Vessels

The mooring field will accommodate xx vessels excluding any dinghies that may be attached to parent vessels. All persons arriving by vessel or dinghy must register at the Harbormaster's Office (or through other means as available) within twelve (12) hours of arriving, although advance registration is recommended. Vessels shall be moored in designated mooring areas only, as assigned by the Harbormaster. The sole method for securing a vessel to a mooring shall be by securing the bow of the vessel to the mooring buoy pendant. Securing the mooring to the stern of any vessel is prohibited. Additionally, the use of additional anchors to supplement the provided mooring is prohibited. Anchoring within the marked boundaries of the Facility is prohibited unless approved by the Harbormaster.

Dinghies shall be kept on board or tied closely to parent vessel when not in use and shall not impede or restrict access to fairways or channels. Subleasing of the vessel or assignment of the rental agreement is prohibited. Rafting or mooring of more than one vessel to any buoy, without prior approval of the Harbormaster, is prohibited.

2.6 Order of Mooring Assignment

Moorings will be assigned by the Harbormaster on a first come, first served basis.

2.7 Length of Stay

The mooring field will potentially accommodate live-aboard vessels. A live-aboard is defined in the xxxxxx as a "vessel docked at the facility and inhabited by a person or persons for any five (5) consecutive days or a total of ten (10) days within a 30-day period. Liveaboard status at the Facility will not exceed six (6) months within a 12-month period. Nor shall any such vessel constitute a legal primary residence." All moorings are available to vessels on a first come, first served basis, including transient vessels.

Commented [EB1]: Replace by USVI Code language

2.8 Illegal Activities Prohibited

Any illegal activity within the Facility is grounds for immediate prosecution under the provisions of applicable laws. It is the intent of the xxx to prosecute each violation to the fullest extent of the law. If there is reasonable cause for suspicion of an illegal activity occurring in the Facility, the appropriate authorities will be contacted immediately. xxxx has a zero-tolerance policy for drug use or possession. Such use or possession shall be immediately prosecuted to the fullest extent of the law.

Commented [EB2]: Replace by USVI appropriate language and regulator policies

2.9 Waste Management/Marine Pollution

Discharge of human and/or pet waste overboard within the Facility is prohibited. Upon entering the Facility, vessels shall secure their sewage holding tank to ensure no overboard discharge. All vessels with holding tanks must provide documentation to the Harbormaster of sewage tank pumpout within 3 days of entering or reentering the mooring field.

Latitude 18 marina will provide a pump out station that shall be used. Alternatively, a mobile pumpout boat may service the area.

There shall be absolutely no overboard discharge of any sewage into any area of the Mooring Field except into a pumpout vessel.

All vessels with overnight or liveaboard occupants will be required to have their holding tanks pumped out no less than every seven (7) days minimum without fail and shall provide documentation to the Harbormaster. Violation of this provision shall constitute grounds for immediate ejection from the Mooring Field and forfeiture of security deposit.

Logs to record pump outs and inspections of seals on vessels without holding tanks shall be maintained by the Harbormaster and made available for inspection upon reasonable notice.

2.10 Use of Dinghy Dock

The Facility will provide a dinghy dock to accommodate dinghies of Facility customers at no charge on a first come, first served basis. At the discretion of the Harbormaster, dinghies of non-Facility customers shall pay a landing fee and be issued a Use Permit by the Facility. First priority for dinghy dock use and dinghy landing shall be given to dinghies of Facility customers over all other dinghies with regard to space availability. Dinghies of the Facility customers must display such identification markers as provided by the Harbormaster. These markers will establish proof of current Facility tenancy or Use Permit as required at all times to use the dinghy dock.

Use of the dinghy dock is restricted to such reasonable limits on time as may be established by the Harbormaster. No dinghy shall be left at the dinghy dock for more than twenty-four (24) continuous hours without prior authorization from the Harbormaster. Tying of dinghies by Mooring Field tenants or other non-Mooring Field vessel owners to the docks, piers and seawalls owned by the Harbormaster is prohibited. Unattended dinghies found tied to the docks, piers and/or seawalls of the Harbormaster's facility will be considered abandoned and will be seized and impounded.

Unattended dinghies found tied to the dinghy dock will be considered abandoned and will be seized and impounded for purposes of disposal.

2.11 Unattended Vessels/Abandonment of Vessels

Any vessel left unattended for more than twenty-four (24) continuous hours without the prior approval of the Harbormaster will be considered abandoned by xxx. The xxx will pursue removal of the vessel pursuant to the provisions of xxxxxx.

Commented [EB3]: Include USVI statutes

2.12 Fueling Prohibited

The fueling of vessels within the Facility is prohibited. Vessel fueling is permitted at designated fueling stations only.

3.0 RESPONSIBILITIES OF LICENSEES/TENANTS

3.1 No Liability on Use of Mooring Facility

Neither the Facility owner nor its operator assume no liability for the use by vessel owners, operators, guests, or other personnel, of the moorings, dinghy dock, and/or upland amenities comprising the Facility. The Facility owner, operator, their personnel, and the Harbormaster assume no liability for personal possessions, vessels, or associated equipment, including dinghies, while at the Facility.

3.2 Safe Operation of Vessels

Reckless operation of any vessel, including a recreational vessel, small craft, or dinghy that, in the sole judgment of the Harbormaster, is an endangerment to life, property, or other vessels, shall be grounds for immediate ejection from the Facility.

3.3 Use of Vessel/Pumpout Facilities

Vessels moored at the Facility are required to utilize nearby pumpout facilities or the pumpout vessel. Those vessels utilizing a Type I or Type II Marine Sanitation Device are prohibited from discharging within the mooring field boundary and will be required to prove the functionality of their system or to seal their tanks. Any use of its system must be in strict compliance with USCG and State regulations.

All vessels are prohibited from discharging sewage, treated or untreated, within the mooring field boundary. All live-aboard vessels must provide the Harbormaster with documentation of pumpout once every seven (7) days from one of the available facilities. Such documentation will be required on a monthly basis and will be kept on file at the Harbormaster's Office and with the Martin Ship Pump Out Program Manager.

The Harbormaster, at their discretion, may require the placement of trace dye tablets into the holding tank of any vessel moored within the Facility to verify that it meets the zero discharge standards of the Clean Vessel Act.

3.4 Repairs Prohibited

Boat repairs and the refitting of vessels, including any activities which could result in the discharge of materials into the water or within the Facility, are prohibited. Minor repairs and maintenance work may be conducted only with the prior authorization of the Harbormaster. The determination of whether the proposed work qualifies as minor repairs and maintenance is at the sole discretion of the Harbormaster. The Harbormaster shall be contacted in advance of any proposed work to verify compliance. Additionally, only Facility owner staff or their contractors shall undertake and accomplish any repairs to docks, piers, moorings, or any other common area structures or appurtenances. Any unauthorized activity in violation of the above may result in ejection from the Facility and forfeiture of security deposit.

3.5 Storage of Materials or Equipment

Personal equipment, property, or stowage facilities may not be kept or used on the Facility's dinghy dock, walkways, common areas, or parking lot, except by permission of the Harbormaster and for limited time and exceptional circumstances. No motorized vehicle of any kind shall be driven, operated, stored or otherwise permitted on the Facility's dinghy dock, walkways, common areas, or parking lot except by permission of the Harbormaster or in areas clearly designated for the use or parking of motorized vehicles. Use of motorized vehicles in these areas is by Harbormaster-issued permit only.

3.6 Waste Disposal/Trash Removal

Discharge of any solid or liquid waste (human or pet) into the waters within the Facility is prohibited. Violators are subject to immediate ejection from the Facility, and the Harbormaster will notify the appropriate authorities for enforcement action. Mooring Field Patrons are encouraged to utilize upland facilities.

Garbage must be transported and deposited ashore in Facility receptacles. Vessel owners shall contact the Facility for information regarding proper disposal of waste oil, rags, bilge socks, absorbents, anti-freeze, used fuel, and batteries. The Facility does not accept any hazardous waste or materials for disposal.

3.7 Prohibited Activities (including, but not limited to)

- Major repairs and/or refitting of vessels or associated equipment
- Charcoal, wood, or open flame burners (cooking stoves to be UL approved)
- Swimming or diving within the Facility unless performing vessel maintenance or minor repairs (to be approved by Harbormaster)
- Advertising, or soliciting
- Disorderly, rowdy, or boisterous conduct; excessive noise that disrupts the quiet enjoyment by others of the Facility
- Hanging laundry from the vessel in public view
- Anchoring within mooring field boundaries without prior approval from the Harbormaster
- Berthing at the Latitude 18 marina, except for pre-approved exception granted by Harbormaster

3.8 Manatees and Other Protected Species/Feeding of Wildlife

Vessel owners and their guests shall acquaint themselves with the publications and warnings available at the Harbormaster's Office regarding safe operation in waters frequented by manatees, and they must abide by all laws, ordinances, rules, and regulations governing the operation of watercraft in the presence of manatees. Harassment of Federal- or State-listed protected species is illegal and will not be tolerated. Lists of these species are available at the Harbormaster's Office. All vessel owners and guests are prohibited from feeding or leaving food for wildlife, particularly birds or endangered species.

3.9 Vessel Inspections/Boarding by Law Enforcement Personnel

The Harbormaster shall be authorized to conduct periodic vessel inspections in order to ensure compliance with Federal and State safety and marine sanitation regulations. Denial of an inspection shall be grounds for termination of the vessel's Mooring Agreement. The vessel owner shall fully comply with the directions of the Harbormaster and Law Enforcement personnel and shall allow access to their vessel by those personnel as necessary.

3.10 Reporting of Fuel/Oil Spills

Vessel operators/owners shall contact the Harbormaster's Office and National Response Center Spill Hotline (800-424-8802) when an oil/fuel spill is discovered. Oil absorbent pads and containment booms are located at the Harbormaster's Office and are available for deployment in the event of a spill. The use of detergents to break up oil spills is strictly prohibited.

Commented [EB4]: Update with USVI appropriate information

3.11 Vessel Cleaning

Cleaning or washing vessels with detergents containing phosphates, chlorine, or petroleum distillates is prohibited within the Facility.

3.12 Non-tenant Use of Moorings Prohibited

Non-tenants are prohibited from mooring within the Facility without prior approval from the Harbormaster, except in cases of emergency or as otherwise provided in this Plan.

3.13 Misuse of Facility Amenities

The misuse of any Facility amenity is grounds for ejection from the Facility. If any tenant, guest, or crew damages the property or equipment of the Facility due to neglect, misuse, failure to follow stated directions, or vandalism, they shall be held responsible for the cost of repair and replacement, as well as any criminal or civil charges for the activity.

3.14 Use of Upland Laundry, Restrooms and Showers

Laundry facilities, restrooms and showers designated for use by mooring field tenants are provided on the upland support facility. Facility tenants shall not use amenities designated for Latitude 18 marina tenants.

3.15 Use of Parking Lot

Parking facilities designated for Facility tenants and guests will be provided. All vehicles must be operable and properly licensed and must display a valid parking permit issued by the Harbormaster. All bicycles must be kept at the bicycle rack provided in the common area when not in use. All vehicles must be removed within twenty-four (24) hours after the vessel is vacated from the Facility.

3.16 Unauthorized Departure of Vessels

It is unlawful for vessel operators/owners to remove their vessel from the Facility without authorization from the Harbormaster when the vessel has a delinquent dockage balance. The Harbormaster has the authority to prevent its removal until the delinquent dockage balance is satisfactorily addressed.

3.17 Liens

The Facility owner will maintain a maritime lien and/or a possessory lien pursuant to xxxx Statutes xxx against the vessel, its appurtenances, and contents for all unpaid mooring fees, late charges, storage fees, repairs, improvements, work-related storage charges or any damage caused to any mooring or any other property of the Facility. The Facility owner will pursue all remedies permitted by law, including but not limited, to foreclosure of any lien and/or nonjudicial sale of any vessel. Nothing in this section precludes the Facility owner from maintaining any other lien or pursuing any other legal remedies available for any breach of the Mooring Agreement or this Management Plan.

3.18 Emergency Repairs

As part of the Mooring Agreement, tenants must grant consent to the Harbormaster such that in the event of an emergency the Harbormaster has the authority to have necessary repairs made to the tenant's vessel, as economically as possible. Emergencies include, but are not limited to, tropical storms and hurricanes; breakdown of a bilge, fuel, sewage pump, or any other leak; chafed or broken lines; or any other emergency that may imperil the vessel and possibly lead to sinking, damage to other vessels within the Facility, or damage to the Facility. The cost of these repairs, parts, labor, and any other appropriate charges will be billed to the vessel owner and payable within 24 hours of the vessel owner's return or as provided by the Harbormaster.

3.19 Rental Fees

The Facility owner will establish all mooring charges and will assess and adjust any mooring charges as necessary to cover the costs of operation, maintenance, or the projected costs of future expansion of the Facility.

4.0 HURRICANES AND TROPICAL STORMS

4.1 Evacuation of Vessels for Storm Event

Mooring facilities are generally not safe locations for vessels during strong named tropical storms or hurricanes and leaving vessels in mooring fields during such storms could result in significant damage to other vessels, local properties, and the Facility.

The Facility owner requires that all vessels evacuate the Facility at or before the time there is a declared hurricane watch or warning. Tenants are advised that mooring equipment provided in the Facility may not withstand hurricane or tropical storm or associated wind or tidal surge. Removal of vessels from the mooring field is mandatory for a Category I or above hurricane.

After a tropical storm or hurricane watch has been issued, the Harbormaster, a mooring field owner or operator, or an employee or agent of such owner or operator, may take reasonable actions to further secure any vessel within the mooring field to minimize damage to a vessel and to protect Facility property, private property, and the environment and may charge a reasonable fee for such services.

Mooring systems shall be inspected for damage after a named storm has passed to evaluate under water damages. If the mooring equipment is damaged as a result of a tenant's failure to remove their vessel, the tenant may be charged accordingly for the necessary repairs.

4.2 Customer Education

The Harbormaster shall install a permanent information display board in a clearly visible location at the land-based support facility, providing information on:

- Operational provisions and restrictions associated with use of the mooring field and land-based support facility;
- Manatee protection and applicable environmental protection rules and regulations;
- Location and availability of sewage pumpout facilities and procedures;
- Navigational ingress and egress to the mooring field and land-based support facility, including identification of channel markers, shoals, and other significant navigational issues, such as controlling water depths; or by providing charts for sale or a location where they may be purchased.
- Seagrasses, corals, and other significant resources in the adjacent waters, such as their location, protection, and avoidance of impacts, and their importance to the water resources; and,
- Prohibitions on discharging trash, sewage, and hazardous wastes into the water, and ways to minimize discharging grey water into the water.

5.0 SOVEREIGNTY SUBMERGED LANDS LEASE

This mooring field and dinghy dock are also authorized under Sovereignty Submerged Lands Lease No. xxxx.

The lease boundary includes the over-water surface area of the mooring field, encompassing all of the swing areas and square footage between the swing areas, including internal thoroughfares. The lease boundary includes the preempted area for the dinghy dock that contains a temporary mooring area to access a fixed sewage pumpout and for the mooring of a sewage pumpout vessel.

This Management Plan is referenced in xxxxxx.

6.0 OTHER

Add any other regulatory requirement resulting from local rules regarding disability access, information, etc

APPENDIX B

MITIGATION PLAN
FOR
LATITUDE 18 VESSUP BAY MARINA AND MANAGED MOORING FIELD
ST. THOMAS, U.S. VIRGIN ISLANDS


PREPARED BY

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REVISED DECEMBER 2022

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This plan follows the compensatory mitigation guidelines as set forth in 40 CFR Part 230, Compensatory Mitigation for Loses of Aquatic Resources: Final Rule. The fundamental objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to the waters of the United States authorized by DA permits.

I. INTRODUCTION

The Marine Industry in the U.S. Virgin Islands has diminished over the past 30 years due to the emergence of other markets such as the British Virgin Islands and U.S. Coast Guard Requirements. The objective sought through this Application is to provide a World Class Marina with a complement of upland Food and Beverage Establishments, Retail and Support Facilities. This project will become a cornerstone in the Government of the U.S. Virgin Islands Marine Task Force Development. A further objective sought by this project is responsible Environmental Development through the preservation of Habitat for endangered species on the up-land development and the Managed Mooring Field that is proposed as a part of it. Managed mooring fields will include U.S. Coast Guard approved mooring balls, helix type anchors with floated lines, and requirements for sewage pump out stations that are a part of the Upland Development. These measures will have a significant improvement in the water quality in the Bay.

Marina

The proposed marine project is composed of docks and utilities, shoreline restoration and a managed mooring field.

The marina includes pile-supported fixed pier docks for the berthing of yachts. The marina will have 17 dedicated slips and 638 linear ft of alongside dockage, with a total capacity of 2,128 linear ft (approximately 26 vessels). The marina will provide permanent and transient berthing for a mix of vessels ranging from 60 to 200ft, with additional alongside berthing for smaller vessels.

The marina project lies in general location of a marina that was destroyed by previous storm events. The scope of work includes the removal of existing remaining structures, timber piles, sunken debris, and sunken vessels from the marina footprint.

The marina will have fuel service and fuel will provided by dispensers on the fuel dock, as well as in-slip fueling on the main docks slips.

The marina includes wave attenuation devices to provide comfort during operational conditions. A wave screen attached to the main fixed pier is proposed in areas that do not impede circulation flows. A floating wave attenuator is proposed to protect the marina slips facing Muller Bay and to reduce the need for wave screens.

Due to the elevation of the deck of the fixed piers, the docks which service smaller vessels, such as the fuel dock and smaller draft areas, will be provided with dock skirts to prevent small boats from going under the dock.

A new bulkhead will be built in front of the dilapidated existing bulkhead and rectifying the disturbed shoreline comprised of masonry irregular walls and a damaged pier structure, offering a stable water edge for access to the marina docks and marina operations. The seabed in the area adjacent to the new bulkhead will be excavated to achieve – 6.5ft MSL elevation, in order to provide safe draft for the intended operation.

Mooring Field

The mooring field includes 70 mooring buoys divided in in the Muller Bay Mooring Field, over 96 LF of berthing on two floating docks fordinghies, and upland support facilities such as showers, restrooms, and solid waste collection bins. Vessels in the mooring field will have access to the pump out at the fuel dock and will be prohibited by their mooring lease contract to discharge sewage or other pollutants.

The mooring field area will be identified with new markers and additional navigation aids will be installed to better identify the navigation channels. The Port Authority was consulted to validate the navigation channel and location of navigation aids.

Proposed marina will maintain a high standard of operation, compatible with the vessel size and clientele expected. The marina operator will seek a Blue Flag, Clean Marina, or similar certification.

As part of its normal operation, the marina expects to:

- Establish and maintain a management plan that includes environmental management systems;
- Create and maintain an environmental policy that supports the implementation and updates of the environmental management plan;
- Display at the marina the code of conduct that reflects appropriate laws governing the use of the marina and surrounding areas;
- Display information relating to local eco-systems and the local environment;
- Provide marina and mooring lease agreements that include information about regulations, laws and permit conditions governing the use of the marina and its environmental management plan;
- Maintain the operation and promote the use of a sewage pump-out;
- Provide marina and mooring lease agreements that include the prohibition of discharge of sewage, bilge, oil or solid waste to the bay, as proper disposal procedures for fluid and solid waste will be available through the marina;
- Provide adequate and properly identified, segregated containers for the storage of waste oil and general solid waste;
- Provide adequate, clean, and well sign-posted sanitary facilities, including washing facilities are provided for the marina visitors and employees.
- Provide adequate and well signposted lifesaving, first-aid equipment, and fire-fighting equipment
- Prepare emergency plans in case of pollution, fire or other accidents as part of an Approved Spill Prevention Control and Countermeasure Plan. Post safety precautions and information at the marina.
- Provide electricity and water in all marina slips and in-slip fueling in selected marina berths;
- Provide accommodations for disabled people are in place.
- A map indicating the location of the different facilities is posted at the marina

The Latitude 18 marina has been developed since the 1980s. The docks were severely damaged by hurricane Hugo (1989), were repaired, and then were damaged again by hurricane Marilyn (1995), and only a portion would be rebuilt (CZT-7-95W). The marina was completely destroyed by hurricanes Irma and Maria 2017.

At one time dense seagrass, Thalassia testudinum was found in the eastern portion of the marina, however over time it has become less abundant, and the area is now fully mixed with the invasive seavine Halophila stipulacea. In early 2000 there was a *Dendrogyra cylindrus*, a coral which is now listed on the endangered species list, found on the riprap which rap around the point at the northeastern end of the property. Surveys in 2008 did not find this coral and no other ESA corals have been found on the shoreline revetment since that time. The piles and the shoreline revetment which faces north and is in Vessup Bay proper, is degraded habitat with significant algal colonization. These hard structures would not be considered critical habitat due to the amount of algal colonization. A few *Siderastrea spp*. and *Psuedodiploria spp*. are found in this area.

The riprap revetment which extends around the point into Muller Bay enjoys much better water quality and can be considered critical habitat. No construction is proposed for this area. There are scattered corals on this hardbottom although many of the corals were damaged due to a sailboat grounding on the riprap. The sailboat is still aground against the riprap.

There are emergent hard bottom areas to the east in Muller Bay, and there is sparse coral colonization on the emergent rock including *Orbicella faveolata* and *O. annularis* ESA listed coral species. The coral colonization increases to the east, and corals become abundant to the east of the proposed Managed Mooring Field and species such as *Acropora palmata, A. cervicornis, Dendrogyra cylindrus* and *Mycetophyllia ferox* are present, all ESA listed species. Each mooring location proposed has been surveyed and positioned to avoid hard bottom impact and impact to corals. Two buoy locations originally planned were removed from the proposed plan due to potential impacts on corals, while three remain in an area generally classified as hardbottom habitat but will not impact corals or hardbottom as they have been located in sand pockets. All lines and tackle will be floated so as not to damage the seafloor or the corals.

While the invasive seavine is found through Vessup, Muller and Red Hook Bay, there are still expanses of *Thalassia testudinum* and *Syringodium filiforme*. These sea grass beds are damaged by existing mooring practices, anchoring, dragging lines and debris.

The managed mooring field should help to alleviate these impacts and should facilitate recolonization by these species.

To minimize impacts the corals which are in the marina footprint which would be damaged by the dredging, demolition and construction will be transplanted to the hardbottom area to the east. To compensate for unavoidable impacts during construction, debris currently scattered throughout the proposed mooring field will be removed and properly disposed of at the Bovoni landfill.

II. OBJECTIVES

The objective of this mitigation plan is to minimize the impact of the marina and mooring field project and to compensate for unavoidable impacts.

III. SITE SELECTION

The intent is to transplant the 12 corals within the marina footprint to east to the large area of hardbottom. The area enjoys much better water quality than where the corals are currently located.

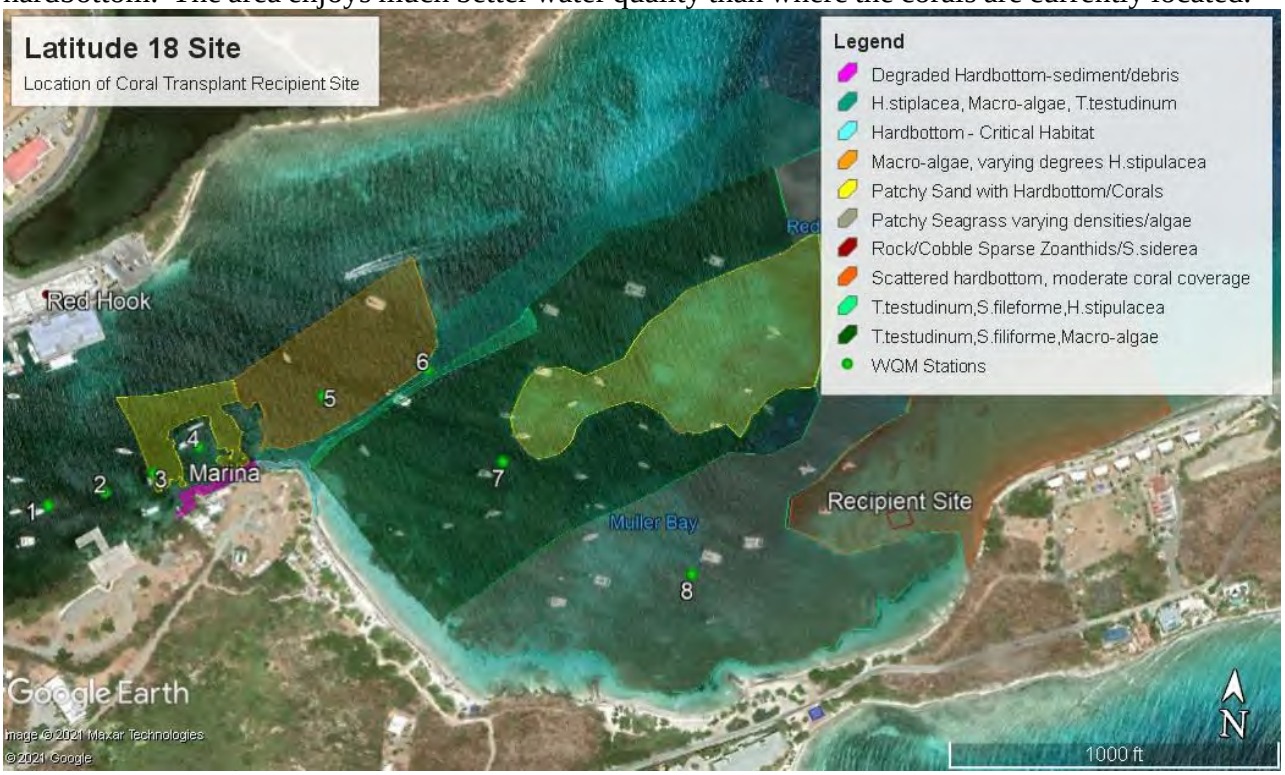


Figure 1. Location of transplant recipient site.

The recipient site is south of the proposed managed mooring field and is an area of broken pavement which enjoys excellent water quality. The corals will be planted at a similar depth from that they were taken from. The area has scattered *Pseudodiploria* and *Siderastrea.*

IV. SITE PROTECTION INSTRUMENT

In order to protect these beds two information buoys will be placed stating that the areas are mitigation site sand has shallow seagrass beds and coral reefs are within the area and no anchoring is allowed.

V. BASELINE INFORMATION

Benthic Habitat Description
General

The project site lies within Red Hook Bay at the intersection of Vessup and Mueller Bay, due to the differences of exposure, circulation and use the water quality to the north of the project site is extremely different that the water quality to the east. Vessup Bay is a very narrow bay which extends just under 0.5miles inland and is only 0.1mile at its widest. The discharge from the Vessup Bay WWTP is located at the very head of Vessup Bay. Vessup Bay is a heavily used for marine uses, with marinas and docks and the Red Hook Marine Terminal is located immediately across the

bay from the project site. The Terminal includes the landing and facility for ferries transiting to St. John and the British Virgin Islands and the landing for car ferries from the island of St. John. Over the last few years Vessup Bay has been significantly impacted by *Sargassum* further impacting the water quality.

At the project site Red Hook Bay opens to 0.34 mile in with and Mueller Bay is located to the east and has significantly more flushing than Vessup Bay and has significantly improved water quality. During surveys, the turbid plume from Vessup Bay was observed moving into or out of the marina area.

Vessup Bay is mangrove lined on the southern shoreline and while the bay used to have relatively large *Thalassia testudinum* and *Syringodium filiforme* beds the bay bottom is now dominated by the Halophila *stipulacea* and macro algae. Only small, scattered seagrass beds remain. Very few corals are found on hard substrates within Vessup Bay, on the VIPA terminal across the bay there are a very few small *Diploria strigosa, S. siderea, S. radians* and *D. labyrinthiformis* on the pilings.

Offshore bay supports seagrass beds composed of *Thalassia testudinum, Syringodium filiforme, Halodule beaudettei, Halophila decipiens* and more recently *Halophila stipulacea*. There are ESA listed coral species which occur on the reefs that fringe each side of the bay and the rocky promontories at Redhook Bay's entrance.

Methods

The area was surveyed on both SCUBA. Mooring locations and corals were located by GPS and were mapped to assist in locating the proposed dock. Species were identified to species within the project area.

The NOAA NOS Benthic habitat map, depicts. This is an accurate description of the benthic habitats within the area. The NOAA NOS map is provided below followed by a benthic habitat map. Inner Vessup Bay is shown as mud with small areas of seagrass along the sides of the bay. The inner harbor is heavily algal colonized, and there is sparse seagrass along the edges. The area immediately off the marina site is shown as sand. This area is colonized by scattered algae and *H. stipulacea.* The NOS map shows seagrass 70-90% offshore, this area is more in the order of 30-40% and this area is highly impacted by *H. stipulacea*, anchors, ropes, and debris. The NOS map shows seagrass continuous along the eastern shoreline, again the seagrass is closer to 50%. The map shows an area of dredging in the bay which shows in the historic aerials shown in Section 6.02.

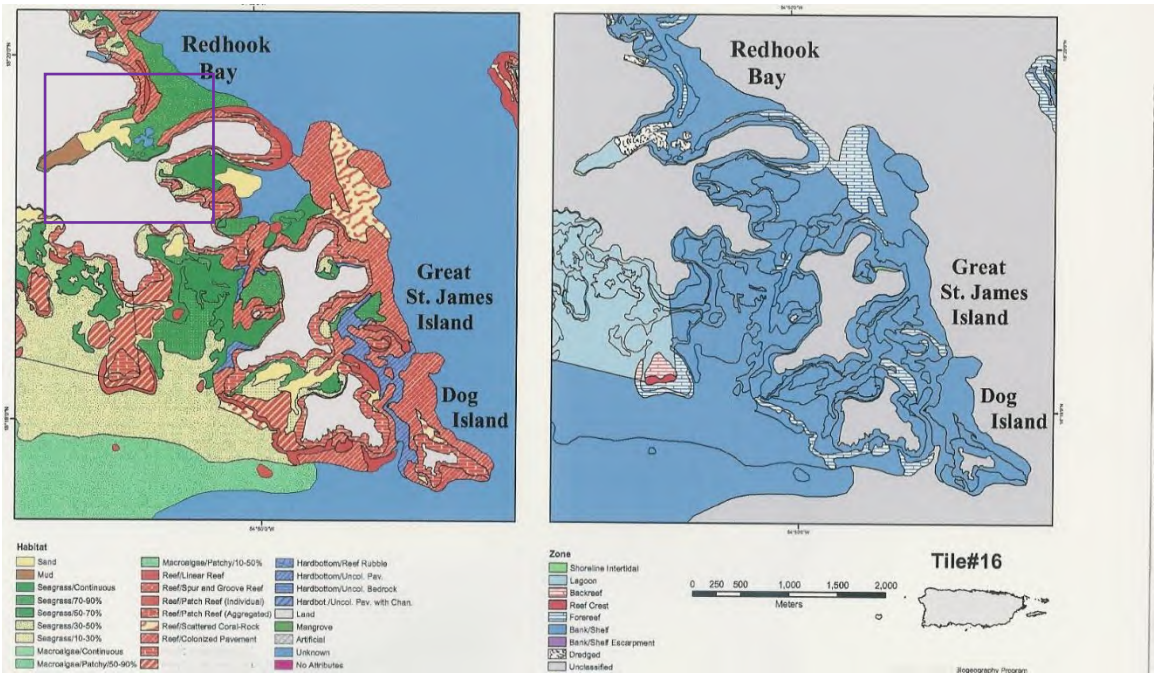


Figure 6.06.1. NOS Benthic Habitat Map Tile 16. Great Bay is shown within the blue box, and the project site is indicated by the red star.

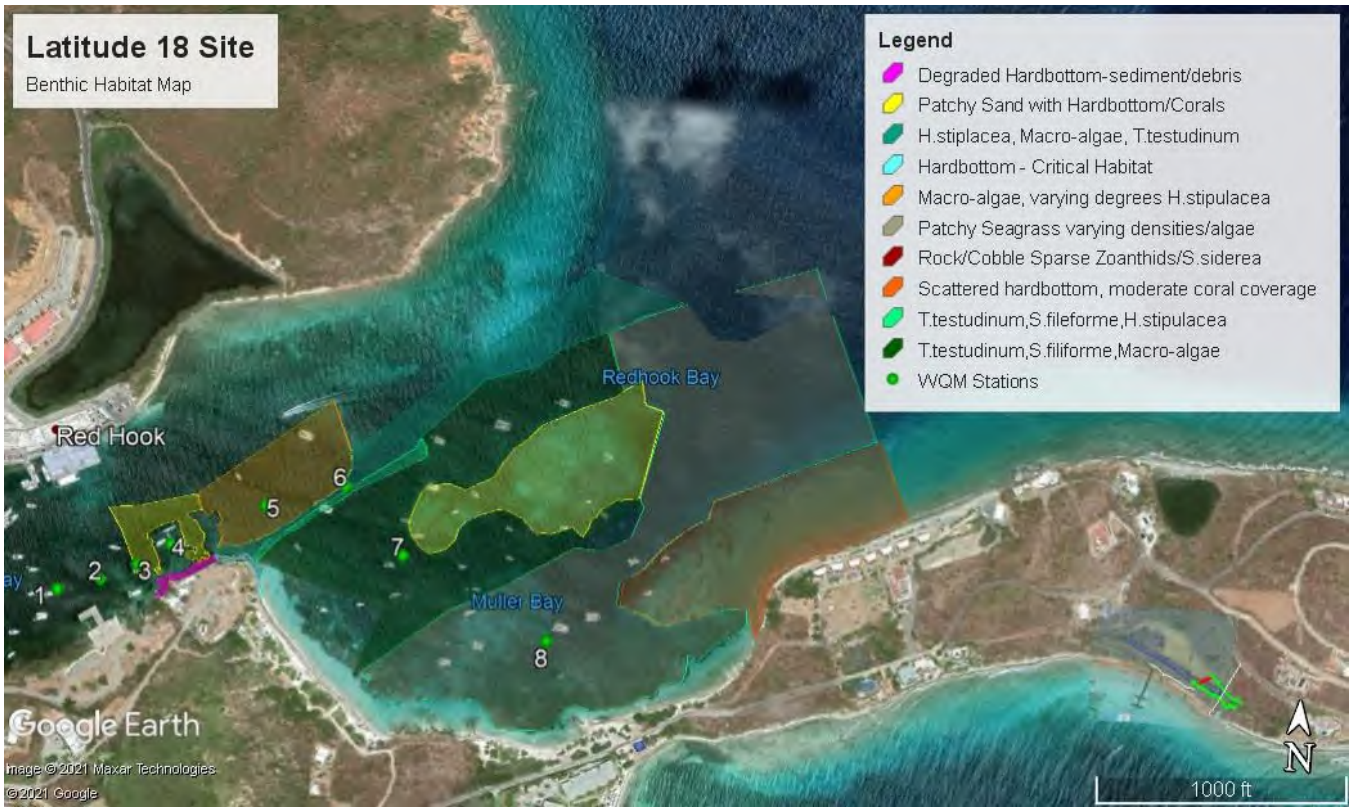


Figure 6.06.2 Benthic Habitat in the marina area

Vessup Bay

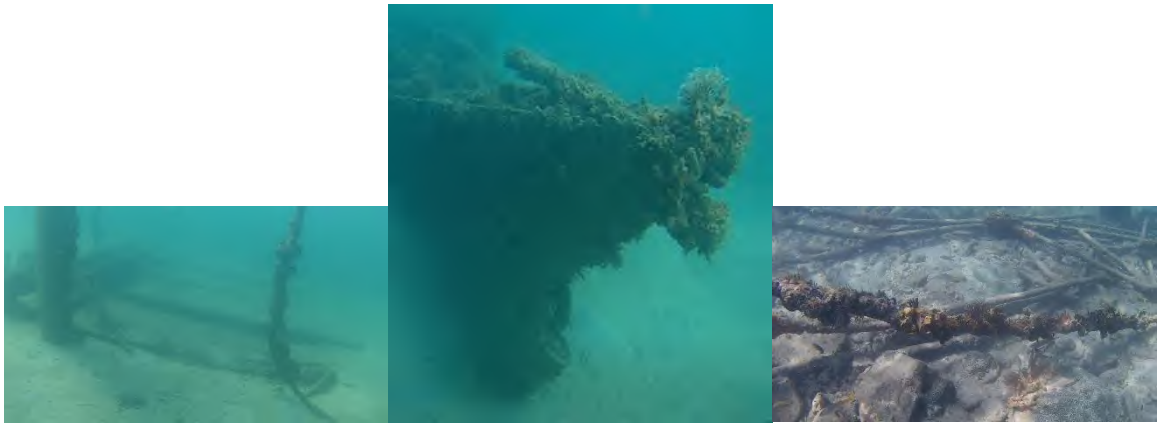
The project area is significantly impacted by the activities which occur within the bay, the boating, the marine vessel discharges, the debris from vessels, the suspension of vessels from propwash and vessels grounding and resuspending sediments and impacting bottom sediments and colonization.

The area is also subject to high nutrients from the WWTP effluent discharge. There are however impacts that are the result of natural phenomena, not just the hurricanes, but the accumulation of Sargassum weed in the head of the bay. The weed accumulates blocking light to benthic organism and then later settles on them as the algae losses its floats and slowly sinks. All of the shallows of the very inner bay have been impacted by the Sargassum.

In the areas shallower than 1' algae is the most abundant colonizer and *Enteromorpha flexuosa, Chaetomorpha sp., Neomeris annulata, Laurencia, Avrainvillea nigricans, Penicillus capitatus, Caulerpa, Acetabularia, Hypnea, Dictoya, Wrangelia,* and *Halimeda* are all present. *Caulerpa spp.* are probably the most abundant. These are scattered amid exposed patches of mud and areas of disturbance. *Halophila stipulacea* has become the most abundant deeper than 1' and covers larger areas than the algae did in shallower water. There are large uncolonized areas, many of which look as though they were the result of vessel activities. There are scattered pieces of debris and broken limbs throughout the Vessup bay. Near the fringing mangrove there are patches of *Thalassia testudinum*.

Marina Footprint and Wave Attenuator

The marina area is impacted by water quality and by the heavy marine activity which has occurred in the area overtime. Offshore around the eastern portion of the old marina the area is a mix of sand and *H. stipulacea*. The pilings and debris which remain in the area are heavily algal colonized with sparse sponge colonization. The stone bulkhead is heavily algal colonized with very sparse corals, palythoas and sponges which are found on bulkhead and stones which have been broken loose from the wall. *Siderastrea siderea, Pseudodiploria strigosa, Zoanthus puchellus* and *Palythoa caribbaeorum* are found on the bulkhead and loose rocks. Millepora alcicornis is found on some of the larger debris and on some of the cables. *Monanchora unguifera, Desmapsamma anchorata,* and *Spirastrella spp*. are found on debris and pilings. *Caulerpa, Cladophora, Cladosiphon occidentalis Acanthophora, Penicillus, Halimeda, Dictyota, Laurencia, Hypnea* and *Cheatomorpha* are all present within the marina footprint.



The seafloor is a mix of uncolonized sand, *Halophila stipulacea,* and scattered *Halimeda opuntia, Udotea flabellum* and *Penicillus capitatus*.

The sponges and corals represent less than 1% of the total bottom cover within the marina area.

Moving to the east there are scattered patches of *algae* amid denser *H. stipulacea*. Moving to the south around the point there is a mix *of Thalassia testudinum* and *H. stipulacea*.

Mooring field and Surrounding Area

There are vast seagrass beds within Muller Bay. The composition and densities of these beds vary with depth and disturbance. The seagrasses *Thalassia testudinum* is intermixed with *Syringodium filiforme* and a minimal amount *Halodule wrightii* can be found. There are some isolate areas where Syringodium is the dominant grass and others where *Thalassia* is the dominant grass. The invasive seagrass is most abundant to the north nearest the channel, but small areas of *H. stipulaceae* were found in the seagrass beds to the south. Found within these beds and within blowout areas are the algae *Caulerpa, Cladophora, Cladosiphon occidentalis Acanthophora, Penicillus, Halimeda, Dictyota, Laurencia, Hypnea* and *Cheatomorpha*. In the outer bay, the seagrass cover ranges between 20 to 100% per meter squared and have blade densities of 17 to 444 blades per m*2*. In the inner bay the coverage is lower due to impact by mooring and anchoring vessels and the maximum coverage is between 30-40%. *Thalassia* is more prevalent in the shallower areas and *Syringodium* dominates at depth.

Towards the east there becomes a mixture of coral colonized cobbles and exposed broken pavement in the grass beds and *Orbicella spp*. and *Porites astreoides* are common.

Within Muller Bay there are areas of dense *Thalassia testudinum* colonization often mixed with *Syringodium filiforme* and areas of dense colonization by invasive *Halophila stipulacea.* Green algae (*Halimeda spp., Udotea spp., Penicillus capitatus*) abundant in seagrass. *Dictyota pulchella* abundant in bushy tangled clumps among seagrass and green algae species.

The algae makes up as much as 50% of the bottom cover in some areas. Seagrass abundance varies from *T. testudinum* to *S. filiforme* as the most abundant.

Debris is found throughout the seagrass and algal beds. There are sunked boats, and pieces of upland debris.

There are several sunken vessels, dinghies and even a historic anchor which someone was using as a mooring.

Tyere are large scars that are the result of moorings. These are the result of mooring ropes dragging on the bottom. Some of the areas are recolonizing with algae and *H. stipulacea*.

Some moorings use large rocks, other have three-point moorings which are resulting in large scour areas.

Moving to the east the area becomes intermixed with rocks and cobbles, slowly becoming a mix of emergent pavement with sand channels. At the edge of the pavement there loose rocks which have scattered corals. As shown in the photograph there are scattered helix anchors which are scattered where they have pulled out of the shallow sand.

The more emergent rocks have been colonized by *Porites porites* and *Agarica agaricities. Orbicella faveolata* is present on scattered rocks and on the pavement to the east.

The largest corals are found on the pieces of rock which have the most vertical relief.

Corals and hard bottom become more abundant to the east. The moorings have been positioned to avoid all corals and all hardbottom areas.

Table 6.06 Species in the project area

Algae	Marina	Wave Attenuator	Mooring Site	Greater Area
Halimeda opuntia	X	X	X	X
Halimeda moline	X	X	X	X
Dictyota pulchella	X	X	X	X
Penicillus captitatus	X	X	X	X
Caulerpa mexicana	X	X	X	X
Laurencia papulosa	X	X	X	X
Galaxaura oblongata			X	X
Jania spp			X	X
Sargassum fluitans	XX		X	X
Halimeda copiosa			X	X
Ventricaria ventricosa			X	X
Wrangelia penicillata	X		X	X
Seagrass				
Thalassia testudinum		X	X	X
Syringodium filiforme		X	X	X
Halodule wrightii		X	X	X
Halophila stipulacea	X	X	X	X
Sponges				
Ircinia compana			X	X
Agelas confera			X	X

Aplysina cauliformis			X	X
Aplysina fulva			X	X
Aplysina insularis			X	X
Desmapsamma anchorata	X	X	X	X
Holopsamma helwigi	X	X	X	X
Neofibularia nolitangere			X	X
Xestospongia muta			X	X
Callispongia vaginalis			X	X
Cinachyrella kuekenthali	X		X	X
Ircinia strobilina	X		X	X
Niphates erecta			X	X
Verongula gigantea			X	X
Callyspongia plicifera			X	X
Monanchora unguifera	X		X	X
Spirastrella spp.	X		X	X
Corals				
Favia fragum			X	X
Siderastrea siderea	X		X	X
Siderastrea radians	X		X	X
Porites astreoides			X	X
Orbicella faveolata			X	X
Gorgonia ventalina			X	X
Meandrina meandrites			X	X
Montastrea cavernosa			X	X
Pseudeodiploria strigosa			X	X
Dichocoenia stokesi	X		X	X
Eusmilia fastiginia			X	X
Agaricia agaricites			X	X
Soft Corals				
Palythoa caribbaeorum	X			
Gorgonia flabellum			X	X
G. marina			X	X
Pseudoplexuara			X	X
Plexuara			X	X
Muricea			X	X
Invertebrates				

Echinometra lucunter	X		X	X
Diadema antillerum	X		X	X

VI. IMPACT OF PROJECT

Impact of Construction and Mooring Installation

The construction of the marina expansion will impact the marine environment physically through the placement of piles and could impact water quality through siltation and turbidity during construction, dredging and de-watering of spoils. A water quality monitoring plan will be implemented to monitor control devices and to ensure repairs are made when necessary and additional measures are taken with installed devices are not effective.

The marina and wave attenuator will impact areas that are colonized by algae and *Halophila stipulacea*. The removal of the piling will result in the loss of encrusting sponges and the placement of the new shee tpile wall will impact 12 corals (5 *Psuedodiploria strigosa* and 7 *Sidereastrea siderea*). The corals will be relocated as part of the mitigation for the project. The mitigation plan is found in Appendix D.

The dock will be providing slips for 28 vessels many larger than vessels currently within the area. The marina is designed so that vessels should have adequate depth for maneuvering and there should be minimal suspended sediment. The marina will have fuel service and the system designed has secondary containment, double wall fuel lines and leak detection systems. The marina will have a Terminal Facility License and a Spill Prevention Containment Countermeasure Plan. Fuel supplies will be situated at the main docks as well as on the dinghy dock in the event of inadvertent spills. Fueling of dinghies on the dinghy dock or in the mooring field will be prohibited.

No discharge from vessels at the marina will be allowed and the marina will have a pump out facility.

The moorings have been sited to avoid all hardbottom and corals. Some of the mornings will be in areas of mixed seagrass, and in areas with *H. stipulacea* and algae. The moorings will utilize helix type anchors and floating lines so there will be minimal impact on seagrasses after the moorings are installed. There may be some blade and rhizome lost during installation. Seagrass currently is thriving in the outer bay under vessels in the bay where ropes and anchors are not impacting the seafloor.

The implementation of the managed mooring field with proper moorings and the cleanup of the debris from the seafloor will allow for the recolonization of the damaged areas by sea grasses. Unfortunately, due to the presence of *H. stipulaceae* it may colonize many of the areas which are cleared or no longer swept by lines before *T. testudinum, S. filiforme* or *H. wrightii* can spread into the area.

Vessels are currently moored haphazardly through Vessup and Mueller Bay. Most have anchoring systems which are damaging the seafloor. Many of the vessels are live-a-boards who simply dump their waste straight into the sea. Some vessels have been allowed to sink on their moorings.

The introduction of a managed mooring field will not only stop many of the ongoing physically damaging things which are occurring, but it should help reduce the nutrient loading by providing

pump out service and enforcing it in the managed mooring field.

Comparison Existing Mooring/Anchoring Conditions vs Managed Mooring Field Mooring Buoys	• mooring buoys installed by individuals • different technical solutions / equipment – weights, engine blocks, rocks, anchors • boat anchors and anchorage chains and ropes dragging seabed • short term anchoring • vessels deploying multiple anchors • no moorings available for short-term rental	• Engineered mooring buoys professionally installed • elastic mooring lines that do not impact seabed • Mooring buoys installed and maintained by Management • Short and long-term users have the mooring buoy system available for rent
Water Space Use	• Mooring locations only approximately located • No control on anchoring locations • Limited and unreliable markers • Encroachment into navigation channel • Boats close to the public beach	• Mooring field area with offset to beaches (approximately 300ft) • Mooring field area with offset to navigation channels • Mooring field area markers and mooring buoys precisely located • Additional navigation channel markers • Prohibition to drop anchor • Enforcement by Management
Sewage and Waste Management	• No control of boat discharges • No control over repair activities • Detriment to water quality	• prohibition of discharge of sewage, bilge, oil or solid waste to the bay • sewage pump out • solid waste bins • proper disposal procedures for fluid and solid waste will be available through the marina • Management provides control and enforcement
Upland services	• Some services provided at American Yacht Harbor	• Dinghy docks professionally installed • Dinghy docks maintained and repaired by Management • Restrooms, showers, and laundry • Authorized access to land • Car and bike parking • WIFI

VII. MITIGATION WORK

Corals

Divers will wear latex gloves for all coral handling and will immediately change gloves if they suspect they may have come in contact with a diseased coral. Divers will survey the marina footprint and will collect all the corals that have colonized rocks and pieces of debris and place them on the transport tray. Corals which are attached to the stone bulkhead will be carefully removed with a narrow chisel and hammer taking care not to break the coral. The coral will then be placed directly on the transport tray or in a basket on the transport tray. Where possible sponges, anemones, urchins, palythoa and other non-sessile organisms will be relocated. Once all 12 corals are on the tray, it will be lifted under the boat for transport to the recipient site. The boat will travel at less than 5 knots per hour to the recipient site and the tray will be lowered close to the seafloor. Divers will then remove the corals and find suitable attachment points for the corals which will not impact existing organisms and will allow for good attachment. The area for re-attachment will be thoroughly cleaned of all algae using a wire brush or chisel. The coral will then be re-attached with 2-part underwater epoxy. As of March 2021, no disease was noted on any of the 12 corals to be relocated. At the time of transplant if any of the corals show signs of disease they will not be relocated or handled. Corals will be re-attached the same day they are removed.

Compensatory Mitigation

In order to compensate for unavoidable impacts which may occur as a result of the construction or operation of the marina and mooring field, debris within the mooring field will be collected and disposed of at the Bovoni landfill. Small pieces of debris will be picked up by hand by divers and larger pieces will be collected utilizing lift bags. Care will be taken to ensure any fish or invertebrates in the debris are not accidently removed from the water. Any debris which is coral colonized will not be removed.

VIII. MAINTENANCE PLAN

Once the project is completed, the coral recipient sites will be surveyed on a bimonthly basis for a period of two months to ensure that the corals are remaining attached. Corals will be resituated or reattached, as necessary. After the first 2 months, the recipient site will be monitored on a bi-annual basis for a period of 5 years.

IX. ECOLOGICAL PERFORMANCE STANDARDS

The object of this mitigation is to minimize impact to benthic resources which provide high quality habitat to marine species. In order to objectively evaluate the mitigation project, ecological performance standards must be established.

It is the intent of this transplanting program to obtain at least 85% overall survival, with secure substrate attachment, five years after relocation. Overall survival of corals shall be defined as no net loss in pooled (by species) Live Tissue Area Index or an increase in pooled (by species) Live Tissue Area Index[1]. Latitude 18 is committed to put forth the greatest effort to see that the

[1] V.I. Department of Planning and Natural Resources Coral Relocation Mitigation Recommendations, https://dpnr.vi.gov/czm/programs-viczmp/coastal-zone-permitting-viczmp/

relocation is successful and that they obtain the greatest potential survival of transplanted coral.

X. MONITORING REQUIREMENTS

Monitoring the compensatory mitigation project site is necessary to determine if the project is meeting its performance standards, and to determine if adaptive measures are necessary to ensure that the project does meet its objectives.

As per the guidelines set forth in §230.96 Monitoring the mitigation project will be monitored for a minimum period of 5 years.

All 12 corals will be marked and photographed on a monthly basis for a monthly basis for a period of 2 months after the transplant after the first 2 months the corals will surveyed bi-annually for a period of 5 years. Corals will be monitored for health, disease, and sediment impacts.

XI. LONG TERM MANAGEMENT PLAN

As part of the management of the mooring field the area will be periodically surveyed and any new debris will be collected

XII. ADAPTIVE MANAGEMENT PLAN

In the event that there are difficulties with the mitigation or if the mitigation is deemed unsuccessful as planned, Latitude 18 is prepared to take additional steps to see that compensatory mitigation goal is achieved. If necessary, extended monitoring and maintenance or additional actions will be undertaken in order to meet the mitigation goal.

If the mitigation goal is not met, the applicant will prepare a detailed report of why the mitigation was not successful. Latitude 18 will meet with the permitting agencies to determine the additional compensatory mitigation needed to meet the mitigation goal.

XIII. FINANCIAL ASSURANCES

Latitude 18 is committed to conduct this compensative mitigation plan and will guarantee that the mitigation plan, maintenance, and monitoring will occur as proposed. Latitude 18 will secure a performance bond or some other type of financial guarantee that is accessible to the U.S. Army Corps of Engineers in the amount necessary to complete the transplant and required monitoring, long-term maintenance of the informational buoys as well as covering any contingencies that may occur. The bond will be prepared following the guidance set forth in the U.S. Army Corps of Engineers Regulatory Guidance Letter No. 05-1 dated 14 February 2005 SUBJECT: Guidance on the Use of Financial Assurances, and Suggested Language for Special Conditions for Department of the Army Permits Requiring Performance Bonds.

APPENDIX C

LATITUDE 18 MARINA

Tree Boa Protection Plan

November 2022

Introduction

Latitude 18 purchased property within Estate Nazareth with the intention of developing a World Class Marina with an upland mixed use commercial development. Consolidated parcel 9B-A comprises a total of 5.556 acres. The entire area is zoned W-1-Waterfront Pleasure. The Proposed Development is permitted by the Virgin Islands Code as a matter of right. The project site contains a peninsula that forms the southern entrance to Red Hook Bay. That peninsula is a rocky abutment that extends to the National Park Service property on the East side and abuts the Vessup Beach area to the south.

The property lies within the range of the Virgin Islands tree boa (*Chilabothrus granti*, formerly *Epicrates monensis granti*) and the tree boa is known to occur in the immediate area. The Virgin Islands Tree Boa is a listed Endangered Species Act species (1979) and is included in Appendix I of the Convention on International Trade in Endangered Species (CITES). The Tree Boa is also listed as U.S. Virgin Islands protected species. Much of the main marina site is cleared and offers little in the way of habitat for these species. Habitat with good interdigitation exists in the overgrown western portions of the property and in some of the areas of denser vegetation near the beach. To avoid and minimize effects to the Virgin Islands tree boa to the greatest extent feasible, Latitude 18 will ensure the following measures are implemented. All areas slated for development will follow the Virgin Islands' Tree Boa Protocols and the Reasonable and Prudent Measures from the U.S. Fish and Wildlife's Programmatic Biological Opinion (July 23, 2022) which includes hand clearing before any machine work ensues.

Reasonable and Prudent Measures and Conservation Methods

1. Prior to the start of the clearing activities Division of Fish and Wildlife (DFW) will conduct a VI Tree Boa training session for all individuals who will be involved with hand clearing of the project area. This will involve training on tree boa identification and what to do if a tree boa is

encountered. DFW must be contacted at least 10 working days prior to any clearing on the site to allow adequate time to schedule the training. This must be done before any sitework is begun. Educational posters or signage with photographs and illustrations of the VI Tree Boa will be displayed prominently at the project site before any work begins. Proposed signage is found in Attachment A. Director Nicole Angeli and Julie Plotkin of the Division of Fish and Wildlife are the points of contact for training and may be contacted at 340 775-6762 or 340 773-1082 or by email at nicole.angeli@dpnr.vi.gov, or Julia.Plotkin@dpnr.vi.gov .

2. Prior to any construction activity, including removal of vegetation and earth movements, the boundaries of the project area and areas to be excluded and protected will be clearly marked in the project plan and in the field to avoid further habitat degradation into forested and conservation areas.
3. Once areas are clearly marked, and prior to the use of heavy machinery and any construction activity (including removal of vegetation and earth movement), biologist or personnel with experience on this species will survey the areas to be cleared to verify the presence of any VI Tree Boa within the work area.

   3a. The VI Tree Boa survey will be conducted during the night(s) prior to any vegetation clearing starts according to the action plan. Boas will be searched beginning not earlier than 7:30 PM and ending not earlier than 9:30 PM within the Action Area and proceed according to the Standard Procedures following the capture of a VI Tree Boa which follows within this document. And if a VI Tree Boa is found it can be relocated accordingly. Nocturnal searches are in addition to diurnal searches not in lieu of.
4. Photographs of the VI Boa will be prominently displayed at the site and a monitor will be designated who has been trained regarding the tree boa who can assist in helping protect the tree boa if they are encountered during hand clearing. Proposed signage is found in Attachment A.
5. Hand clearing will commence from northeast to southwest allowing boas an opportunity to move towards the forested areas to the east and south. Vegetation should first be cut about one meter (36”) above the ground, prior to the use of heavy machinery for land clearing. Once land is cleared by hand, this will allow boas present on site to potentially move away on their own to adjacent available habitat.

6. Any stone walls or naturally occurring rock piles must be carefully dismantled by hand as these are refuges for the snake. This will allow any boas present to vacate the site without injury.
7. If a VI boa is found within any of the working or construction areas, activities should stop at the area where the VI boa is found and information recorded as to size, where it was found and if possible, include a photo of the animal (dead or alive) and its behavior. Activities at other work sites, where no boas have been found after surveying the area, may continue.
8. If any VI Boa is found, it will not be relocated. The boa will be captured and temporarily held and
9. the USVI Department of Planning and Natural Resources (DPNR), Division of Fish and Wildlife will be contacted immediately so that they may determine the disposition of the boa. Director Nicole Angeli and Julie Plotkin of the Division of Fish and Wildlife are the points of contact for training and may be contacted at 340 775-6762 or 340 773-1082 or by email at nicole.angeli@dpnr.vi.gov, or Julia.Plotkin@dpnr.vi.gov .
10. If boas are injured DFW or the monitor will be contacted immediately so that someone can retrieve the injured boa to get it to someone who can help it. No activity will occur in that area until VIDFW is contacted and the steps should be taken are determined. Based on how the boa was injured protocols might to able to be adapted to minimize future injuries.
11. If a tree boa is killed the carcass is to be carefully collected by the monitor and put on ice and taken to DFW so that it can be frozen, and its DNA used to provide information regarding the boa.
12. When a brush or debris pile is encountered it will be taken apart by hand if at all possible, to allow the boa to safely move away.
13. The site is to be left undisturbed for 14 days after hand clearing and prior to the use of heavy machinery. However manual work may continue to be performed during this time and any vegetation may be moved by hand.
14. VIDFW will make another site visit prior to the start of the use of heavy equipment to ensure all protocols have been carefully followed.
15. Measures should be taken to avoid and minimize VI boa casualties by heavy machinery or motor vehicles being used on site. Any heavy machinery left on site (in staging) or near potential VI boa habitat (within 50 meters of potential boa habitat), needs to be thoroughly inspected each morning before work starts to ensure that no boas have sheltered within engine compartments or other areas of the equipment. If VI boas are found within vehicles or equipment, boas need to be safely captured and relocated accordingly.
16. Should the forms of take reach the amount or extent of take (5 VI Tree Boas) during construction, the Recipient shall terminate the authorized activities and contact the U.S. Fish and Wildlife Service within 24 hours in order to reinitiate consultation. The Service and VIDPW and the Recipient will re-consult to determine whether authorized activities should continue as proposed and whether modifications or stipulations are warranted.
17. If a VI boa is accidentally injured or killed during capture and relocation activities during the Action, and the Recipient shall terminate the authorized activities and contact the Service within

24 hours to reinitiate consultation. The Service and VIDFW and the Recipient will re-consult to determine whether authorized activities should continue as proposed and whether modifications or stipulations are warranted.

The contact information for the U.S. Fish and Wildlife Service must be followed: Lead Biologist: Jan Paul Zegarra at Jan_zegarra@fws.gov, Endangered Species Program Coordinator: Jose Cruz at Jose_Cruz-Burgos@fws.gov, 305-304-1386; Deputy Field Supervisor: Marelisa Rivera:Marelisa_rivera@fws.gov, 305-304-1814. All reporting must be submitted at caribbean es@fws.gov. Contact information for V.I. Fish and Wildlife is 340 775 -6762, Director: Nicole Angeli nicole.angeli@dpnr.vi.gov. The U.S. Army Corps of Engineers must also be notified if consultation must be reinitiated, CESAJ-RD-SA@usace.army.mil. A list of contacts has been provided at the end of this document and will also be posted on the site.

The following Standard Procedures must be followed while capturing, handling, transporting, temporary holding, relocating, and tracking VI boas in order to minimize the risk of injury and mortality to the species.

A. V.I. Division of Fish and Wildlife and the Latitude 18 shall identify who will capture VI boas and assess and determine if a boa has been injured because of project activities, and if it is in need of veterinary care or rehabilitation. If an injured VI boa needs veterinary care or rehabilitation, V.I. Division of Fish and Wildlife, and the Latitude shall inform the Service immediately.

B. The Recipient must ensure that any permitted individuals, contractor, recipients or cooperators follow proper procedures and methods for capturing, handling, temporary holding, relocating of the VI boa. The following procedures will be followed:

i. All VI boas shall be handled safely to avoid injury. The preferred method of capture is by hand, although a snake hook or stick may also be used if snake is uncatchable by hand, or to help move the snake into a safer position for capture.

ii. All VI boas may be temporarily held during and for relocation purposes. Boas will be handled as little as possible and they shall not be kept for more than three days from the day of capture. Temporary holding of boas will be in burlap or strong cloth bags (1 boa per bag) and/or secured containers, which must be placed in cool dry areas that are not in direct sunlight or extreme temperatures. Bags shall be placed inside a container with other boas each inside their own bag and labeled properly. All containers shall be well-ventilated and with a secure lid to prevent boas from escaping.

iii. Only qualified, experienced personnel, with a required Territorial or Federal applicable permits may place PIT tag injections. PIT tags may be subcutaneously injected mid-body using sterile syringes. When injecting tags, keep the needle parallel to the boa's body and do not force the needle into the muscle tissue or between the ribs. Snakes greater than 400 mm (15.7 in) in length, but that

weigh less than 100 grams(3.5 oz), may be PIT tagged with a 5 mm (0.19 in.) PIT tag. An 8 mm (0.31 in) PIT tag may be used for all snakes that weigh over 100 grams (3.5 oz).

iv. The Recipient and/or contractors shall obtain all necessary permit(s) from the corresponding Territorial agency for capturing, handling, transporting, temporary keeping, relocating, and tracking VI boas.

In order to monitor the impacts of incidental take, the Recipient must report the progress of the Action and its impact on the species to the Service as specified in the Incidental Take Statement (ITS) (50 CFR §402.14(i)(3)). The Recipient is required to immediately notify the Service if the amount or extent of incidental take specified in this ITS is exceeded during construction.

The ITS states in Table 6-1 that:

Table 6-1. Estimates of the amount of take (# of individuals) caused by the Actions by species, life stage, and form of take, collated from the cited BO effects analyses.

Common Name	Life Stage	# Of Individuals	Form of Take	BO Effects Analysis Section
PR boa	Adult or juvenile	20	Capture or Release	No Jeopardy
VI boa	Adult or juvenile	5	Capture or Release	No Jeopardy

Latitude 18 will immediately contact the Fish and Wildife Service, USACE and Division of Fish and Wildlife if the amount or extent of incidental take specified in the ITS (5) is exceeded during construction.

A. For all VI boa sightings (dead or alive), the recipient shall ensure that an effective monitoring and reporting method is established. Reporting shall include the following and should injury or mortality occur during the Action, the Recipient shall contact the Service within 24 hours of the event, the recipient must report:

i. Date, time, and location (latitude/longitude) of the sightings and relocation sites.

ii. Size, weight and sex (if possible) of the VI boa.

iii. A photograph of the snake as found or after capture.

iv. Description of how and what caused the take in the case of injury or death.

v. Description of any additional conservation measures that may be implemented to further avoid and minimize take.

B. Dead Boas will be carefully collected by the monitor and put on ice and taken to DFW so that it can be frozen, and its DNA used to provide information regarding the boa.

C. In case of an injured boa, the Recipient must contact the Service immediately to coordinate for veterinary care, if needed.

By implementing these measures, the impact to the VI Tree Boa can be minimized.

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