



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
ANTILLES OFFICE
FUND. ÁNGEL RAMOS ANNEX BLDG., SUITE 202
383 FRANKLIN DELANO ROOSEVELT AVE.
SAN JUAN, PUERTO RICO 00918

August 19, 2019

Regulatory Division
South Branch
Antilles Permits Section

PUBLIC NOTICE

Permit Application No. SAJ-1992-50067 (SP-DCM)

TO WHOM IT MAY CONCERN: The Jacksonville District of the U.S. Army Corps of Engineers (Corps) has received an application for a Department of the Army permit pursuant to Section 404 of the Clean Water Act (33 U.S.C. §1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403) as described below:

APPLICANT: Hon. Carlos López-Bonilla, Mayor
Municipality of Rincón
P.O. Box 97
Rincón, Puerto Rico 00677

WATERWAY AND LOCATION: The project would affect waters of the United States associated with the Mona Passage and the existing basin at the former Marina de Rincón facility. The project site would be located at Punta Ensenada, Black Eagle Road (which intersects Road PR-413 at Km 0.9), Ensenada Ward, Municipality of Rincón, Puerto Rico.

Directions to the site are as follows: From the Rincón town square (Muñoz Rivera Street), take Road PR-115; when you come to a fork on the road, go left onto PR-413 and continue driving until you reach the intersection with Black Eagle Road; turn left onto Black Eagle Road. The project site would be at the end of this road.

APPROXIMATE CENTRAL COORDINATES: Latitude: 18.344153°
Longitude: -67.260165°

PROJECT PURPOSE:

Basic: Docking/storage space and marine access for boats

Overall: Re-open the former Marina de Rincón facility to provide docking/storage space and safe marine access for boats in Rincón.

BACKGROUND: On December 7, 1981, the Corps issued a permit (79F-5023) to Mr. Gilberto Velázquez-Sánchez authorizing the construction of 10 finger piers and a breakwater measuring 150 ft long x 10 ft wide x 3 ft high (above mean sea level), and

the excavation of 1,500 cubic yards of material for an access channel, to provide docking facilities for a commercial marina (Marina de Rincón). Said permit expired on December 7, 1984, but the authorized work was not finalized. On July 25, 1985, permit number 85LP50008 was issued to complete the previously authorized work and to improve the marina facility by constructing a 480 ft long x 3 ft wide wooden boardwalk, 14 additional finger piers, and a 41 ft long x 12 ft wide concrete boat ramp, and to perform maintenance dredging of approximately 200 cubic yards of material. This permit expired on July 25, 1990. On November 4, 1992, emergency permit number 199250265 was issued to the Border Patrol for the dredging of 50 cubic yards of sand from the marina entrance channel to be able to take their boat out of the marina, since the entrance channel was blocked. Said permit was intended to be valid until the owner of the marina would obtain a new permit under permit application number 199250067. On August 16, 1995, permit number 199250067 was issued authorizing Mr. Velázquez-Sánchez to perform periodic maintenance dredging at the marina basin and entrance channel to previously authorized depths, and to discharge the dredged sand into navigable waters south of the marina entrance. This permit expired on August 16, 2000. On June 7, 2002, a new permit application to perform periodic dredging at the Marina de Rincón entrance channel was denied by the Corps based on: concerns regarding the need for constant dredging of the marina entrance and the associated coastal erosion/accretion impacts to the beach down drift from the marina (which provides nesting habitat for federally protected sea turtles); non-compliance issues with previous permits; and the marina owner's failure to consider other project alternatives (such as re-designing the marina breakwater and/or relocating the entrance channel) that could potentially prevent or reduce the accumulation of sand at the entrance channel and the resulting need for constant dredging. Subsequent permit applications/requests submitted on 2004 and 2009 for the same or very similar proposals were not entertained by the Corps based on the previous denial. Marina de Rincón has remained closed since 2004. The Municipality of Rincón has recently acquired the Marina de Rincón property. The Municipality envisions to re-open the marina and, as described below, proposes a re-design of the entrance channel in order to address the sand erosion/accretion issues raised in the past for this project.

EXISTING CONDITIONS: As mentioned above, the former Marina de Rincón facility is located at Punta Ensenada, on the west coast of Puerto Rico. The marina property occupies approximately 0.6 acres, and is adjoined by the Rincón Public Beach (Playa Balneario) to the southeast and by the Tres Palmas Marine Reserve (TPMR) to the northwest. The TPMR includes an extensive coral reef area parallel to the shoreline that features one of the healthiest and best-developed communities of the federally protected Elkhorn (*Acropora palmata*) coral in Puerto Rico. The marina facility currently consists of the basin (that measures approximately 240 ft long x 115 ft wide, has an average depth of 5 feet, and is filled with stagnant runoff water from adjacent areas) and a concrete boat ramp located towards the northeast corner of the basin, which is partially overgrown by vegetation and is in poor condition. The basin perimeter is bordered by a short seawall with a concrete cap that has no visible signs of spalling. The former wooden docks/finger piers located along the east and west sides of the marina basin are no longer existent. Only a few PVC pilings remain in place. The

northern and southern margins of the marina basin (including the marina entrance) are overgrown by mangroves and other coastal vegetation. Two rock structures flank the former marina entrance channel, a longer breakwater on the south side of the channel and a shorter breakwater on the north side of the channel. The entrance channel is completely filled with sand (due to an apparent predominant pattern of northward sediment transport along the shoreline towards the marina entrance), forming a beach in the area. A concrete boat launch ramp that was built after the closing of Marina de Rincón exists to the northeast side of the shoaled marina entrance channel, and currently serves as the only boat launching facility in Rincón.

An environmental assessment document provided by the applicant, which includes a report (dated July 2016) with the results of both a hydrological survey of the Marina de Rincón basin and a qualitative assessment of the marine benthic communities in the immediate vicinity outside of the marina, documented the occurrence of freshwater within the marina basin. The report also documented the occurrence of very fine, dark organic bottom sediments within the basin, with no vegetative growth and very limited presence of macroscopic organisms.

The NOAA's Benthic Habitat Maps depict the immediate vicinity of the marina entrance channel and the general vicinity of the Punta Ensenada area as consisting of reef/colonized bedrock, reef/scattered coral-rock, and reef/colonized pavement with channels. However, the results of the above-referenced qualitative marine benthic assessment indicate the presence of unconsolidated sandy bottom without any significant epibenthic community at the marina entrance channel. The results of the assessment also revealed colonization of the submerged portions of the rocks bordering the marina entrance channel by turf algae, small sponges and encrusting colonies of the Lesser Starlet (*Siderastrea radians*) coral. In addition, the benthic assessment report describes the submerged portions of the long breakwater structure on the south side of the marina as colonized by turf algae, sponges, zoanthids, and encrusting, branching and massive coral colonies of *Siderastrea siderea*, *Porites astreoides*, *P. porites*, *Diploria strigosa*, and the federally protected *Orbicella annularis*. The report further describes the area to the southeast of the marina entrance channel, where Playa Balneario is located, as sandy beach with a submerged beach rock completely colonized by turf and fleshy algae and with some interspersed small encrusting colonies of *S. radians*. Towards the west of the marina entrance channel, where the southern edge of the TPNR coral reef system lies, and to a maximum depth of 4 m, the benthic assessment identified an extended reef crest and the boundary of the reef slope physiographic zones. The report describes the hardbottom at the 3-4 m water depth as colonized by zoanthids, gorgonians, turf algae, and encrusting and mound shaped colonies of *D. strigosa* and *D. clivosa*. Interspersed colonies of several other coral species, including the federally protected *O. annularis*, *A. palmata* and *A. cervicornis*, were also observed within this reef physiographic zone. At a water depth of 2-3 m, the benthic assessment revealed an *A. palmata* dominated zone within the reef crest. Coral colonies of *P. astreoides*, *D. strigosa*, *A. cervicornis*, *Millepora alcicornis*, and *M. complanata* were also present within this zone, but to a lesser extent. According to the

report, the section of the reef located in waters 1-2 m deep exhibited colonization by turf algae, colonial zoanths, and *Millepora spp.*

With regards to federally protected sea turtles, fishes and mammals, the proposed project area lies within the distributional range of the Hawksbill (*Eretmochelys imbricata*), Green (*Chelonia mydas*), Loggerhead (*Caretta caretta*), and Leatherback (*Dermochelys coriacea*) sea turtles, the Nassau grouper (*Epinephelus striatus*), the Scalloped hammerhead shark (*Sphyrna lewini*), and the Antillean manatee (*Trichechus manatus manatus*). Moreover, adjacent sandy beaches to the northwest and southeast of the Marina de Rincón property are reported nesting sites for the federally protected Leatherback (*D. coriacea*) and Hawksbill (*E. imbricata*) sea turtles.

PROPOSED WORK: The applicant seeks authorization to rehabilitate and re-open the former Marina de Rincón facility. The proposed project would require the dredging of about 3,270 cubic yards of material from approximately 0.54 acres of waters of the United States within the marina basin to reach a water depth of 6.5 ft. Dredging the marina basin would result in impacts to approximately 0.06 acres of fringing mangroves existing along the northern margin of the basin. In addition, the project would require the dredging of about 2,354 cubic yards of sand from approximately 0.35 acres of waters of the U.S. to re-open the former marina entrance channel and reach a water depth of 6.5 ft. The total estimated volume of dredged material is 7,200 cubic yards, including over dredge. The marina basin would be dredged and de-watered prior to the dredging and opening of the entrance channel to prevent stagnant freshwater from the basin to flow out into the sea, and to minimize sedimentation/turbidity impacts to adjacent sensitive marine benthic resources. The proposed dredging activities would be conducted from uplands using long-reach excavators and other conventional earth moving equipment (the use of vessels/ barges is not anticipated as part of this project). The dredged material would be temporarily placed in a contained upland site located in the vicinity of the project area for dewatering. Once dry, the dredged material from the marina basin would be transported in dump trucks for final disposal at an authorized upland site, while the dredged sand from the marina entrance channel would be deposited above the mean high tide line in the adjoining beach to the southeast of the marina (as depicted in the enclosed drawings).

The proposed project activities would also include the improvement and extension of the existing breakwaters at both sides of the marina entrance channel. The north side breakwater would be extended approximately 82 ft in a southeast direction and would measure about 42 ft wide, while the south side breakwater would be extended 98 ft in a southeast direction and would have an approximate width of 74 ft. The extension of the breakwaters would require the discharge of about 1,177 cubic yards of fill material (core material and armor rock) into approximately 0.12 acres of waters of the U.S. The proposed project activities would further include the refurbishment of the existing boat ramp within the marina property. The ramp would be refurbished in its existing footprint under dry conditions, concurrent with the dredging of the marina basin. The top 4 inches of the ramp's concrete surface would be removed, the reinforcing steel frame would be replaced, and a new concrete topping would be poured. The proposed

refurbishment of the boat ramp would require the discharge of fill material into approximately 0.01 acres of waters of the U.S.

The proposed project would also entail the installation of a floating dock system in the marina basin. The floating dock system would consist of 12 floating finger piers measuring 25 ft long x 3 ft wide that would be connected to floating headwalks to be installed parallel to the eastern and western margins of the basin. Another headwalk would be installed along the northern margin of the basin. The floating dock system would be supported by 20 14-inches in diameter pilings and would occupy a total surface area of approximately 3,014 sq. ft (0.07 acres). Ten 14-inches in diameter mooring piles would be installed at the end of the boat slips (one between two boat slips). The proposed floating dock system would provide docking space for 20 small vessels.

AVOIDANCE AND MINIMIZATION INFORMATION – The applicant has provided the following information in support of efforts to avoid and/or minimize impacts to the aquatic environment:

According to the information provided by the applicant, potential water quality degradation outside the marina footprint and turbidity/sedimentation impacts to sensitive benthic resources in the vicinity of the project area would be prevented and/or minimized by completing the dredging of the marina basin and the refurbishment of the boat ramp under dry conditions and prior to the opening of marina entrance channel. Additional measures that would be implemented to avoid/minimize potential project impacts to the aquatic environment include: installation of silt curtains and turbidity barriers around the in-water work area during the dredging of the marina entrance channel and construction of the breakwater extensions, and implementation of best management practices (such as installation of erosion control fencing) around the project area, including the temporary disposal site for the dredged material.

COMPENSATORY MITIGATION – The applicant has offered the following compensatory mitigation plan to offset unavoidable functional loss to the aquatic environment:

The applicant has explained that the proposed project would serve to restore, enhance and preserve the navigable waters of the U.S. within the marina premises, since opening the entrance channel would allow for sea water to flow in and out of the marina basin and replace the stagnant freshwater that is currently there, which would improve the local flora and fauna and would restore approximately 0.5 acres of marine soft-bottom habitat. Therefore, the applicant understands that no compensatory mitigation should be required for this project. Notwithstanding, in order to compensate for proposed project impacts to approximately 0.06 acres of fringing mangroves existing along the northern margin of the marina basin, the applicant is proposing the planting of red mangrove trees along a 50 m stretch of the southern margin of the marina.

CULTURAL RESOURCES:

The Corps is not aware of any known historic properties within the permit area. By copy of this public notice, the Corps is providing information for review. Our final determination relative to historic resource impacts is subject to review by and coordination with the P.R. State Historic Preservation Officer.

ENDANGERED SPECIES:

The Corps has determined the proposed project may affect, but is not likely to adversely affect the federally protected Green (*C. mydas*), Loggerhead (*C. caretta*), Hawksbill (*E. imbricata*) and Leatherback (*D. coriacea*) sea turtles, the federally protected Antillean manatee (*T. manatus manatus*), and the federally protected Nassau grouper (*E. striatus*) and Scalloped hammerhead shark (*S. lewini*). Similarly, the Corps has determined that the proposed project may affect, but is not likely to adversely affect the federally protected Elkhorn (*A. palmata*), Staghorn (*A. cervicornis*), and Lobed star (*O. annularis*) corals, and/or their designated critical habitat. Via separate letter the Corps will request U.S. Fish and Wildlife and National Marine Fisheries Service concurrence with these determinations, as appropriate, pursuant to Section 7 of the Endangered Species Act.

ESSENTIAL FISH HABITAT (EFH): This notice initiates consultation with the National Marine Fisheries Service on EFH as required by the Magnuson-Stevens Fishery Conservation and Management Act 1996. The proposal would impact approximately 0.47 acres of marine bottom, which may be utilized by various life stages of some of the federally managed species within the U.S. Caribbean. Our initial determination is that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries in the Caribbean Sea. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service, Habitat Conservation Division.

NOTE: This public notice is being issued based on information furnished by the applicant. This information has not been verified or evaluated to ensure compliance with laws and regulation governing the regulatory program. The jurisdictional line has not been verified by Corps personnel.

AUTHORIZATION FROM OTHER AGENCIES: A Coastal Zone Management (CZM) consistency certification from the P.R. Planning Board would be required for this project. A Water Quality Certification from the P.R. Environmental Quality Board would also be required.

COMMENTS regarding the potential authorization of the work proposed should be submitted in writing to the attention of the District Engineer through the Antilles Permits Section, Fund. Ángel Ramos Annex Bldg., Suite 202, 383 F.D. Roosevelt Ave., San Juan, Puerto Rico 00918, within 30 days from the date of this notice.

The decision whether to issue or deny this permit application will be based on the information received from this public notice and the evaluation of the probable impact to the associated waters of the United States. This is based on an analysis of the applicant's avoidance and minimization efforts for the project, as well as the compensatory mitigation proposed.

QUESTIONS concerning this application should be directed to the project manager, Mrs. Deborah J. Cedeño-Maldonado, in writing at the Antilles Permits Section, Fund. Ángel Ramos Annex Bldg., Suite 202, 383 F.D. Roosevelt Ave., San Juan, Puerto Rico 00918; by electronic mail at Deborah.J.Cedeno-Maldonado@usace.army.mil; or, by telephone at (787) 289-7036.

IMPACT ON NATURAL RESOURCES: Coordination with U.S. Fish and Wildlife Service, Environmental Protection Agency (EPA), the National Marine Fisheries Services, and other Federal, State, and local agencies, environmental groups, and concerned citizens generally yields pertinent environmental information that is instrumental in determining the impact the proposed action will have on the natural resources of the area.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including cumulative impacts thereof; among these are conservation, economics, esthetics, general environmental concerns, wetlands, historical properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food, and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the people. Evaluation of the impact of the activity on the public interest will also include application of the guidelines promulgated by the Administrator, EPA, under authority of Section 404(b) of the Clean Water Act or the criteria established under authority of Section 102(a) of the Marine Protection Research and Sanctuaries Act of 1972. A permit will be granted unless its issuance is found to be contrary to the public interest.

The US Army Corps of Engineers (Corps) is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other Interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this determination, comments are used to assess impacts to endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

COASTAL ZONE MANAGEMENT CONSISTENCY: In Puerto Rico, a Coastal Zone Management Consistency Concurrence is required from the Puerto Rico Planning Board.

REQUEST FOR PUBLIC HEARING: Any person may request a public hearing. The request must be submitted in writing to the District Engineer within the designated comment period of the notice and must state the specific reasons for requesting the public hearing.

RINCON MARINA PROJECT

RINCON MUNICIPALITY

RINCON, PR



SITE LOCATION MAP



SITE DISPOSAL FACILITY

INDEX OF SHEETS			
SHEET #	TITLE	ISSUE PURPOSE	REV.
COVER	TITLE, SITE LOCATION, SITE DISPOSAL FACILITY, AND INDEX OF SHEETS	PERMIT	1
1	TOPOGRAPHIC SURVEY	PERMIT	1
2	PLAN VIEW OF PROPOSED WORK	PERMIT	1
3	MARINA BASIN DREDGING AREA PLAN VIEW	PERMIT	1
4	MARINA BASIN DREDGING X-SECTIONS	PERMIT	1
5	MARINA ENTRANCE DREDGING AREA AND JETTIES PLAN VIEW	PERMIT	1
6	MARINA ENTRANCE DREDGING X-SECTIONS	PERMIT	1
7	MARINA ENTRANCE JETTIES X-SECTIONS	PERMIT	1
8	FLOATING DOCKS AND PILE LAYOUTS	PERMIT	1
9	QUANTITY TAKEOFFS SUMMARY TABLES	PERMIT	1
10	BOAT RAMP PLAN VIEW	PERMIT	1
11	BOAT RAMP CROSS SECTION	PERMIT	1
12	BOAT RAMP DETAILS	PERMIT	1

TETRA TECH
 251 RECINTO SUR ST
 SUITE 200
 SAN JUAN, PR 00901
 TEL: (787) 722-7929
 FAX: (787) 722-4561



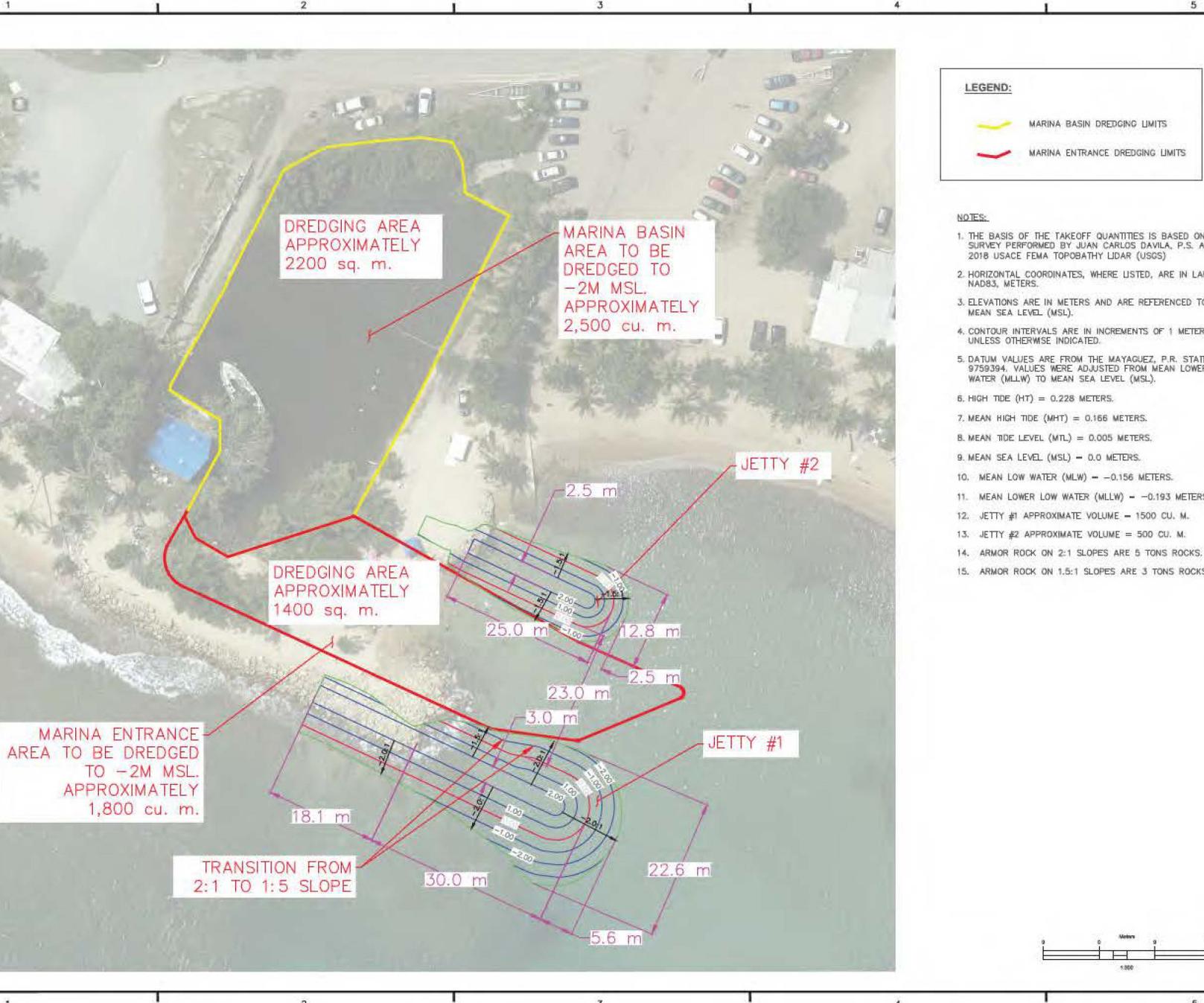
REV.	DATE	DESCRIPTION
1	4-30-2018	ISSUED FOR PERMIT
2	7-29-2018	BOAT RAMP DETAILS ADDED



RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR

TITLE, SITE LOCATION, SITE DISPOSAL FACILITY, AND INDEX OF SHEETS

SHEET REFERENCE:
 COVER



LEGEND:

MARINA BASIN DREDGING LIMITS

MARINA ENTRANCE DREDGING LIMITS

- NOTES:**
1. THE BASIS OF THE TAKEOFF QUANTITIES IS BASED ON A SURVEY PERFORMED BY JUAN CARLOS DAVILA, P.S. AND 2018 USACE FEMA TOPOBATHY LIDAR (USGS)
 2. HORIZONTAL COORDINATES, WHERE LISTED, ARE IN LAMBERT NAD83, METERS.
 3. ELEVATIONS ARE IN METERS AND ARE REFERENCED TO MEAN SEA LEVEL (MSL).
 4. CONTOUR INTERVALS ARE IN INCREMENTS OF 1 METER UNLESS OTHERWISE INDICATED.
 5. DATUM VALUES ARE FROM THE MAYAGUEZ, P.R. STATION 9759394, VALUES WERE ADJUSTED FROM MEAN LOWER LOW WATER (MLLW) TO MEAN SEA LEVEL (MSL).
 6. HIGH TIDE (HT) = 0.228 METERS.
 7. MEAN HIGH TIDE (MHT) = 0.166 METERS.
 8. MEAN TIDE LEVEL (MTL) = 0.005 METERS.
 9. MEAN SEA LEVEL (MSL) = 0.0 METERS.
 10. MEAN LOW WATER (MLW) = -0.156 METERS.
 11. MEAN LOWER LOW WATER (MLLW) = -0.193 METERS.
 12. JETTY #1 APPROXIMATE VOLUME = 1500 CU. M.
 13. JETTY #2 APPROXIMATE VOLUME = 500 CU. M.
 14. ARMOR ROCK ON 2:1 SLOPES ARE 5 TONS ROCKS.
 15. ARMOR ROCK ON 1.5:1 SLOPES ARE 3 TONS ROCKS.

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REV	DATE	DESCRIPTION
1	14-01-2019	ISSUED FOR PERMIT
2	17-09-2019	ISSUED FOR PERMIT
3		ISSUED FOR PERMIT
4		ISSUED FOR PERMIT
5		ISSUED FOR PERMIT
6		ISSUED FOR PERMIT
7		ISSUED FOR PERMIT
8		ISSUED FOR PERMIT
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11		ISSUED FOR PERMIT
12		ISSUED FOR PERMIT
13		ISSUED FOR PERMIT
14		ISSUED FOR PERMIT
15		ISSUED FOR PERMIT



RINCON MARINA PROJECT
 RINCON MUNICIPALITY
 RINCON, PR
 PLAN VIEW OF PROPOSED WORK

SHEET REFERENCE:
 SHEET 2 OF 12

COASTAL VEGETATION & MANGROVE AREA = 250 sq. m.

MARINA BASIN ALIGNMENT

MARINA BASIN AREA TO BE DREDGED TO -2M MSL. APPROXIMATELY 2,500 cu. m.

SEE SHEET 4 FOR CROSS SECTIONS

DREDGING AREA APPROXIMATELY 2200 sq. m.

COASTAL VEGETATION = 620 sq. m.



LEGEND:

- MARINA BASIN DREDGING LIMITS
- IMPACTED VEGETATION DUE TO DREDGING

NOTES:

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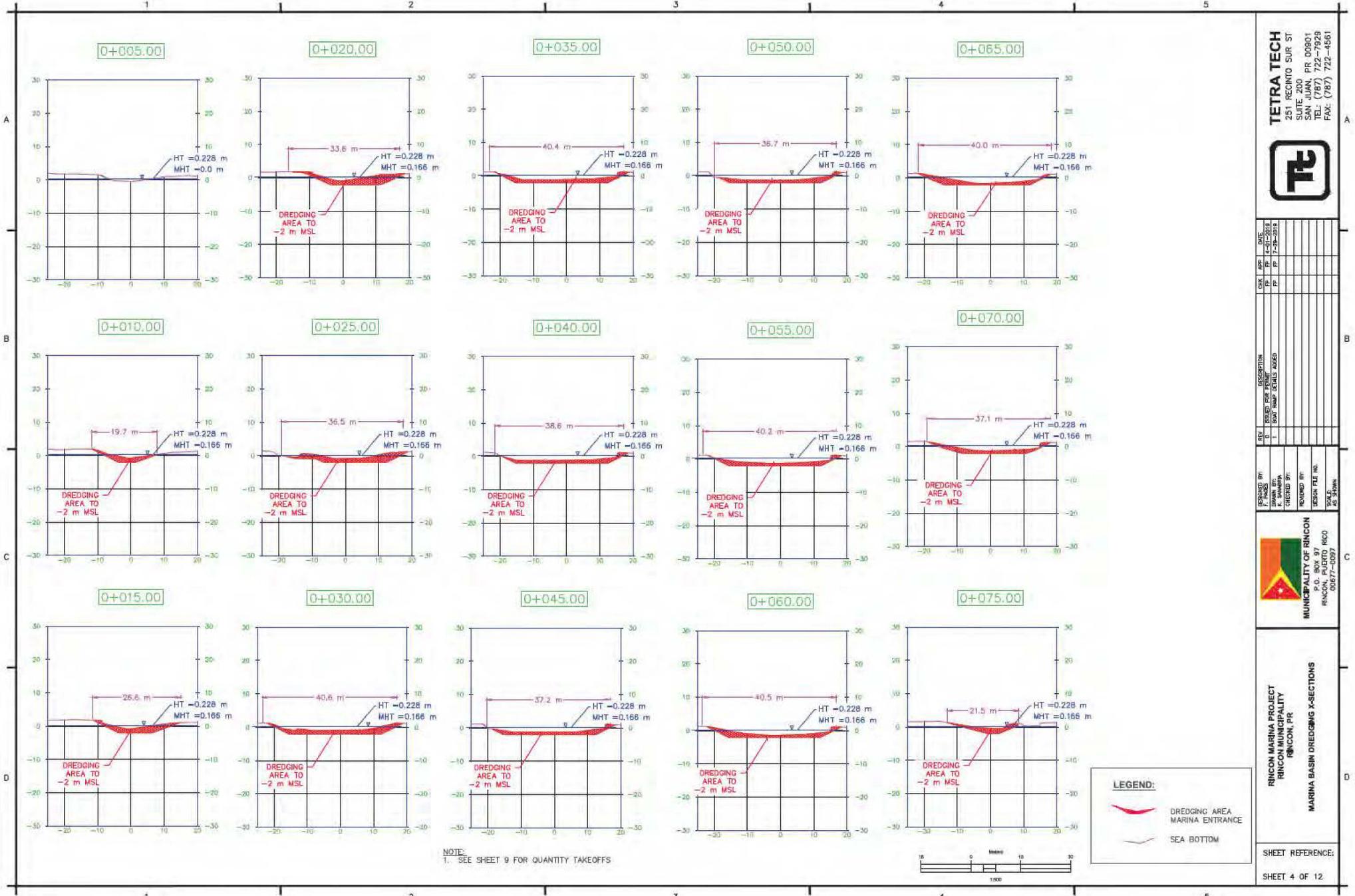
REV	DATE	DESCRIPTION
1	4-01-2019	ISSUED FOR PERMIT
2	7-29-2019	BOAT PUMP DETAILS ADDED

DESIGNED BY:	CHECKED BY:	SCALE:
DRAWN BY:	DATE FILE NO.:	AS SHOWN



RINCON MARINA PROJECT
 RINCON MUNICIPALITY
 RINCON, PR
 MARINA BASIN DREDGING AREA PLAN VIEW

SHEET REFERENCE:
 SHEET 3 OF 12



NOTE:
1. SEE SHEET 9 FOR QUANTITY TAKEOFFS

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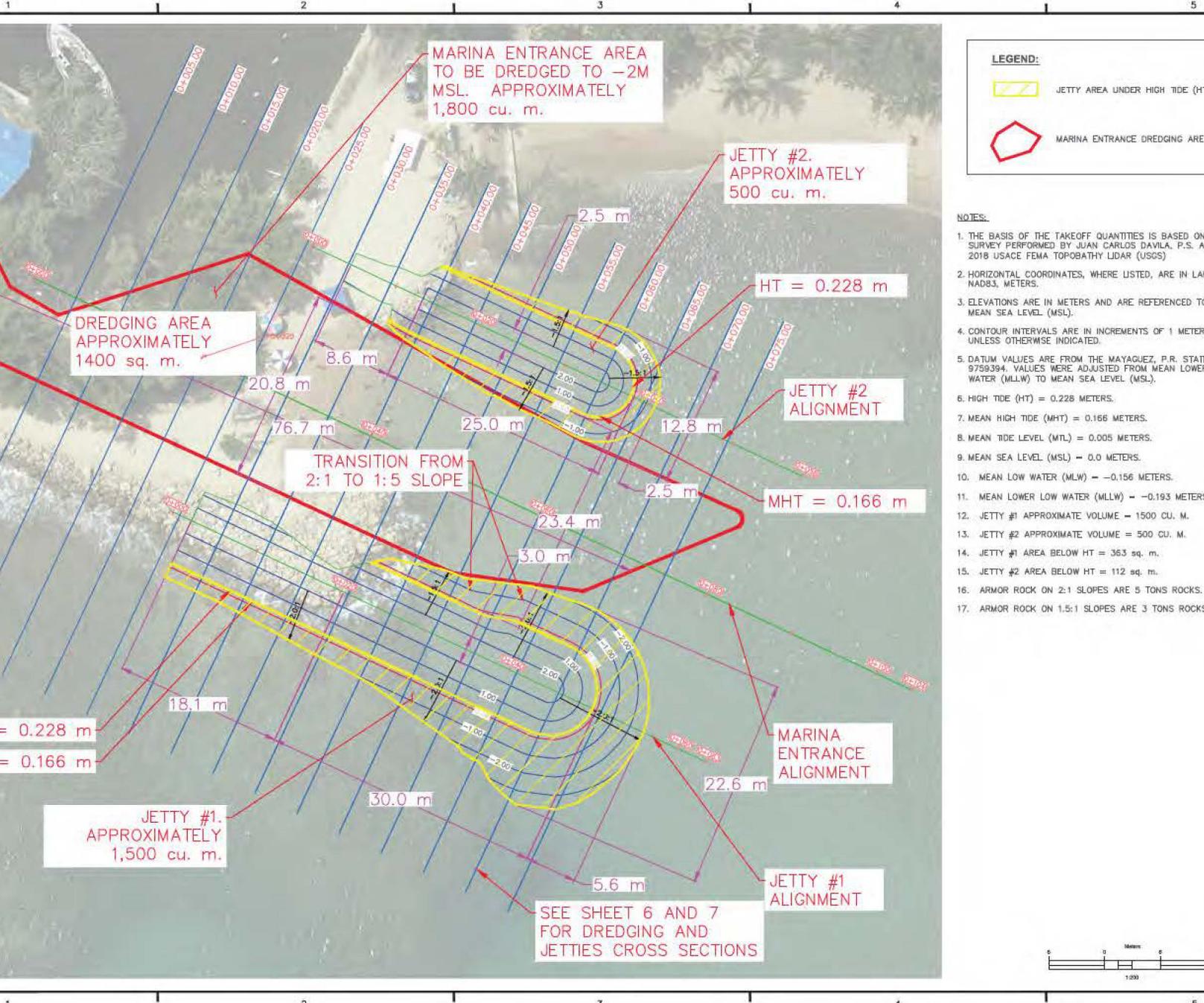


REV	DATE	DESCRIPTION
1	4-01-2019	ISSUED FOR PERMIT
2	7-29-2019	BOAT PUMP DETAILS ADDED



RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR
MARINA BASIN DREDGING X-SECTIONS

SHEET REFERENCE:
SHEET 4 OF 12



MARINA ENTRANCE AREA TO BE DREDGED TO -2M MSL. APPROXIMATELY 1,800 cu. m.

JETTY #2. APPROXIMATELY 500 cu. m.

DREDGING AREA APPROXIMATELY 1400 sq. m.

TRANSITION FROM 2:1 TO 1:5 SLOPE

HT = 0.228 m

JETTY #2 ALIGNMENT

MHT = 0.166 m

HT = 0.228 m
MHT = 0.166 m

JETTY #1. APPROXIMATELY 1,500 cu. m.

MARINA ENTRANCE ALIGNMENT

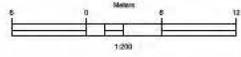
JETTY #1 ALIGNMENT

SEE SHEET 6 AND 7 FOR DREDGING AND JETTIES CROSS SECTIONS

LEGEND:

- JETTY AREA UNDER HIGH TIDE (HT)
- MARINA ENTRANCE DREDGING AREA

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 10. MEAN LOW WATER (MLW) = -0.156 METERS.
 11. MEAN LOWER LOW WATER (MLLW) = -0.193 METERS.
 12. JETTY #1 APPROXIMATE VOLUME = 1500 CU. M.
 13. JETTY #2 APPROXIMATE VOLUME = 500 CU. M.
 14. JETTY #1 AREA BELOW HT = 363 sq. m.
 15. JETTY #2 AREA BELOW HT = 112 sq. m.
 16. ARMOR ROCK ON 2:1 SLOPES ARE 5 TONS ROCKS.
 17. ARMOR ROCK ON 1.5:1 SLOPES ARE 3 TONS ROCKS.



TETRA TECH
251 RECINTO SUR ST
SAN JUAN, PR 00901
TEL: (787) 722-7929
FAX: (787) 722-4561

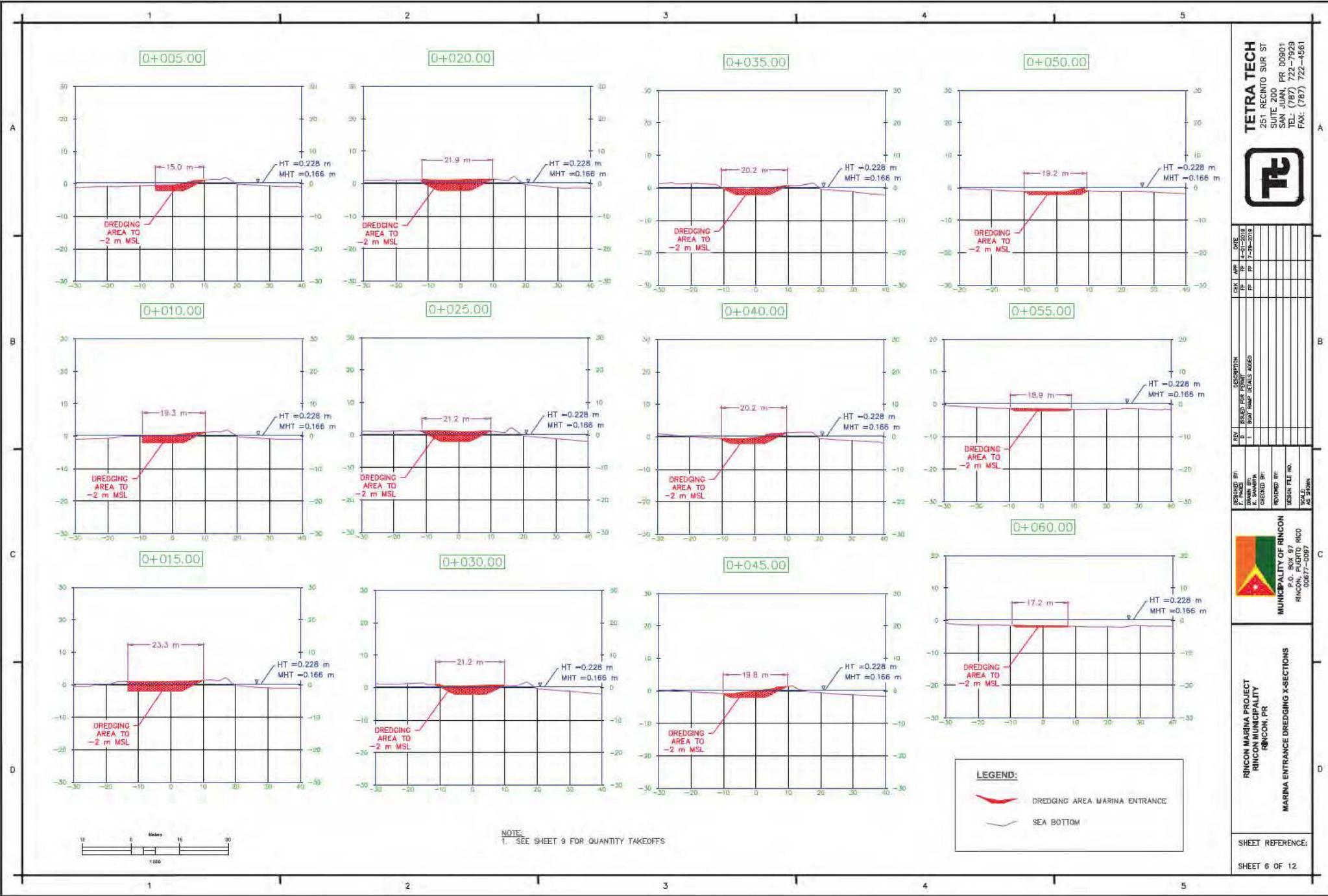


REV	DATE	DESCRIPTION
1	14-01-2018	ISSUED FOR PERMIT
2	17-09-2018	BOAT LIFT DETAILS ADDED

MUNICIPALITY OF RINCON
P.O. BOX 87
RINCON, P.R. 00980
00277-0087

RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR
MARINA ENTRANCE DREDGING AREA AND
JETTIES PLAN VIEW

SHEET REFERENCE:
SHEET 5 OF 12



NOTE:
1. SEE SHEET 9 FOR QUANTITY TAKEOFFS

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REV	DATE	DESCRIPTION
1	4-01-2018	ISSUED FOR PERMIT
2	7-19-2018	1. BOUT PUMP DETAILS ADDED

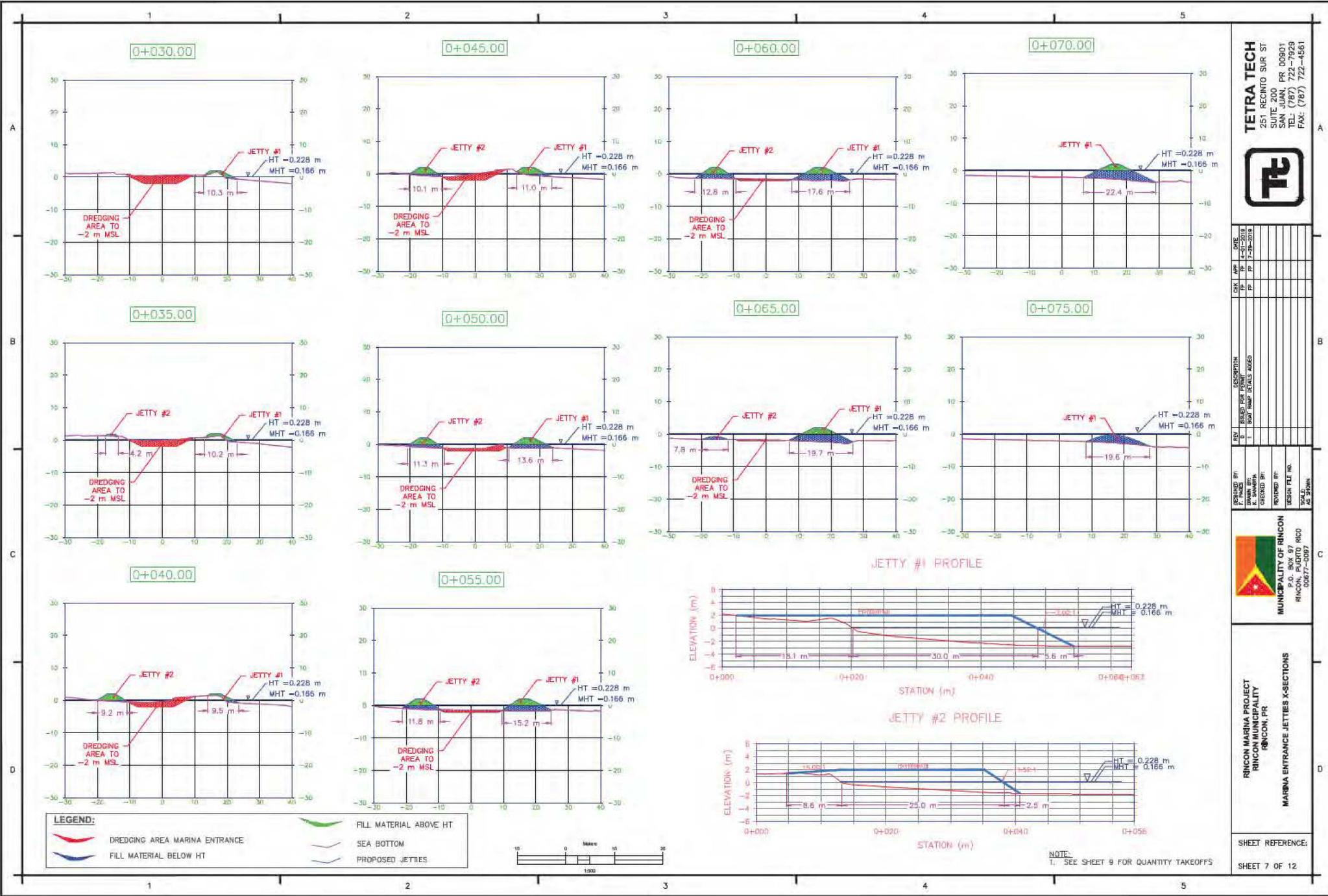
DESIGNED BY	CREATED BY	REVISION FILE NO.
CHECKED BY	SCALE	
	AS SHOWN	



RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR

MARINA ENTRANCE DREDGING X-SECTIONS

SHEET REFERENCE:
SHEET 6 OF 12



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FAX: (787) 722-4561



REV	DATE	DESCRIPTION
1	4-01-2018	ISSUED FOR PERMIT
2	7-29-2018	BOAT LIFT DETAILS ADDED

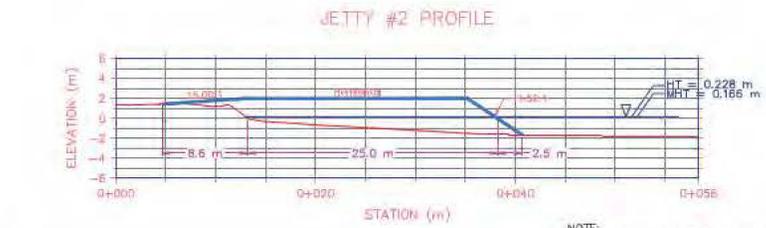
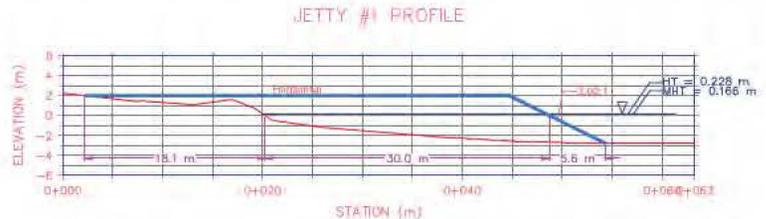
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CHECKED BY: [Name]
SCALE: AS SHOWN



MUNICIPALITY OF RINCON
P.O. BOX 87
RINCON, P.R. 00957

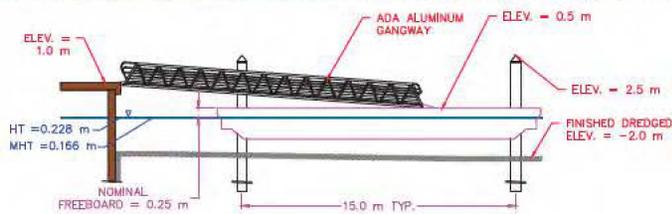
RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR
MARINA ENTRANCE JETTIES A-SECTIONS

SHEET REFERENCE:
SHEET 7 OF 12

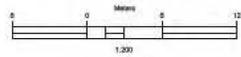




NUMBER OF SLIPS = 20
 NUMBER OF 14 INCH PILES = 30 @ 2.8 m²
 NUMBER OF FLOATING DOCKS = 12 @ 1m X 7.6 m
 TOTAL FLOATING DOCK AREA = 280 m²



TYPICAL GANGWAY ELEVATION
NOT TO SCALE



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REV	DATE	DESCRIPTION
1	14-01-2018	ISSUED FOR PERMITS
2	17-09-2018	ISSUED FOR PERMITS
3		ISSUED FOR PERMITS
4		ISSUED FOR PERMITS
5		ISSUED FOR PERMITS
6		ISSUED FOR PERMITS
7		ISSUED FOR PERMITS
8		ISSUED FOR PERMITS
9		ISSUED FOR PERMITS
10		ISSUED FOR PERMITS
11		ISSUED FOR PERMITS
12		ISSUED FOR PERMITS
13		ISSUED FOR PERMITS
14		ISSUED FOR PERMITS
15		ISSUED FOR PERMITS
16		ISSUED FOR PERMITS
17		ISSUED FOR PERMITS
18		ISSUED FOR PERMITS
19		ISSUED FOR PERMITS
20		ISSUED FOR PERMITS



RINCON MARINA PROJECT
 RINCON MUNICIPALITY
 RINCON, PR
 FLOATING DOCKS AND PILE LAYOUTS

SHEET REFERENCE:
 SHEET 8 OF 12

**MARINA BASIN
DREDGING AREA/VOLUME**

Material Table			
Station	Area (sq. m.)	Volume (cu. m.)	Cumulative Volume (cu. m.)
D+005.00	0.00	0.00	0.00
D+010.00	18.97	47.56	47.56
D+015.00	32.40	128.42	175.99
D+020.00	48.01	201.52	377.01
D+025.00	60.54	246.37	623.36
D+030.00	48.21	246.86	870.26
D+035.00	38.54	216.87	1087.14
D+040.00	32.98	178.80	1265.93
D+045.00	32.83	184.04	1429.98
D+050.00	31.62	181.13	1591.10
D+055.00	35.85	169.17	1760.27
D+060.00	38.31	185.40	1945.67
D+065.00	34.84	182.87	2128.54
D+070.00	32.12	167.41	2295.95
D+075.00	20.63	132.63	2428.57
D+080.00	2.78	59.30	2487.87

**MARINA ENTRANCE
DREDGING AREA/VOLUME**

Material Table			
Station	Area (sq. m.)	Volume (cu. m.)	Cumulative Volume (cu. m.)
D+005.00	22.06	0.00	0.00
D+010.00	37.90	149.52	149.52
D+015.00	57.42	238.30	388.21
D+020.00	52.32	274.35	662.57
D+025.00	46.82	247.86	910.42
D+030.00	38.96	214.45	1124.88
D+035.00	28.98	169.77	1294.65
D+040.00	27.79	141.84	1436.49
D+045.00	27.28	137.66	1574.15
D+050.00	17.33	111.50	1685.66
D+055.00	9.90	68.07	1753.73
D+060.00	6.16	40.15	1793.88
D+065.00	3.12	23.20	1817.08
D+070.00	0.88	10.00	1827.07
D+075.00	0.27	2.96	1829.93

**JETTY #1
AREA/VOLUME ABOVE HIGH TIDE**

Material Table			
Station	Area (sq. m.)	Volume (cu. m.)	Cumulative Volume (cu. m.)
D+030.00	5.73	0.00	0.00
D+035.00	5.68	38.53	38.53
D+040.00	4.38	25.18	63.72
D+045.00	10.44	37.06	100.78
D+050.00	10.81	53.12	153.90
D+055.00	10.81	54.05	197.95
D+060.00	10.85	54.16	252.11
D+065.00	11.60	55.12	307.23
D+070.00	10.84	58.10	365.33
D+075.00	0.00	27.11	392.44

**JETTY #1
AREA/VOLUME BELOW HIGH TIDE**

Material Table			
Station	Area (sq. m.)	Volume (cu. m.)	Cumulative Volume (cu. m.)
D+030.00	1.80	0.00	0.00
D+035.00	1.74	8.84	8.84
D+040.00	2.34	10.20	19.04
D+045.00	5.91	20.62	39.67
D+050.00	15.61	53.70	93.45
D+055.00	22.41	95.05	188.50
D+060.00	30.09	131.28	319.76
D+065.00	38.91	172.51	492.27
D+070.00	48.91	214.56	706.83
D+075.00	29.68	191.46	898.29

**JETTY #2
AREA/VOLUME ABOVE HIGH TIDE**

Material Table			
Station	Area (sq. m.)	Volume (cu. m.)	Cumulative Volume (cu. m.)
D+030.00	0.00	0.00	0.00
D+035.00	1.78	4.41	4.41
D+040.00	9.14	27.26	31.67
D+045.00	9.14	45.70	77.37
D+050.00	9.14	45.70	123.07
D+055.00	9.14	45.70	168.77
D+060.00	8.00	45.36	214.13
D+065.00	0.00	22.51	236.64
D+070.00	0.00	0.00	236.64
D+075.00	0.00	0.00	236.64

**JETTY #2
AREA/VOLUME BELOW HIGH TIDE**

Material Table			
Station	Area (sq. m.)	Volume (cu. m.)	Cumulative Volume (cu. m.)
D+030.00	0.00	0.00	0.00
D+035.00	0.00	0.00	0.00
D+040.00	3.97	9.92	9.92
D+045.00	7.38	28.36	38.28
D+050.00	10.59	44.82	83.10
D+055.00	13.64	60.48	143.59
D+060.00	17.13	76.93	220.51
D+065.00	4.38	53.77	274.29
D+070.00	0.00	10.95	285.24
D+075.00	0.00	0.00	285.24

SUMMARY:

1. JETTY #1

- 1.1. TOTAL APPROXIMATE FILL VOLUME = 1,500 cu.m.
- 1.2. TOTAL APPROXIMATE FILL VOLUME BELOW HIGH TIDE = 900 cu. m.
- 1.3. AVERAGE AMOUNT OF FILL MATERIAL PER RUNNING FOOT BELOW HIGH TIDE (cy/lf) = 1177 cy/131 lf = 9 cy/lf

2. JETTY #2

- 2.1. TOTAL APPROXIMATE FILL VOLUME = 500 cu. m.
- 2.1. TOTAL APPROXIMATE FILL VOLUME BELOW HIGH TIDE = 285 cu. m.
- 2.2. AVERAGE AMOUNT OF FILL MATERIAL PER RUNNING FOOT BELOW HIGH TIDE (cy/lf) = 372 cy/98.4 lf = 3.7 cy/lf

3. MARINA BASIN EXCAVATION/DREDGING

- 3.1. TOTAL AMOUNT OF MATERIAL TO BE DREDGED AT THE MARINA BASIN IS APPROXIMATELY 2,500 cu. m.

4. MARINA ENTRANCE EXCAVATION/DREDGING

- 4.1. TOTAL AMOUNT OF MATERIAL TO BE DREDGED AT THE MARINA ENTRANCE IS APPROXIMATELY 1,800 CU. M.

5. TOTAL EXCAVATION/DREDGING

- 5.1. TOTAL AMOUNT OF MATERIAL IS APPROXIMATELY 4,300 cu. m. PLUS 1,200 cu. m. OF OVER DREDGE FOR A TOTAL OF 5,500 cu. m.

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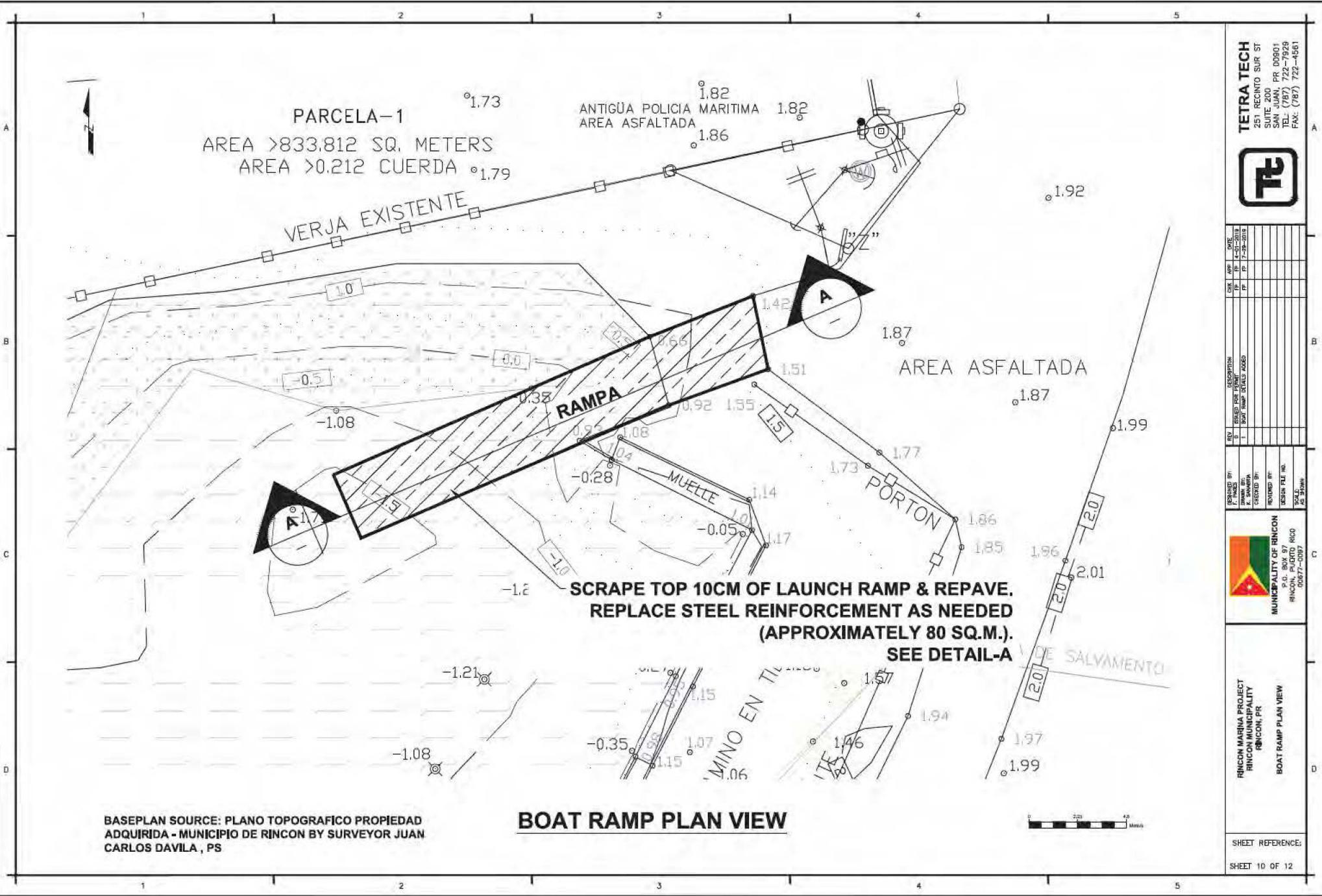


REV	DATE	DESCRIPTION
1	4-20-2018	ISSUED FOR PERMIT
2	7-19-2018	SHORT PUMP DETAILS ADDED



RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR

QUANTITY TAKEOFFS SUMMARY TABLES



PARCELA-1
 AREA >833.812 SQ. METERS
 AREA >0.212 CUERDA

ANTIGUA POLICIA MARITIMA
 AREA ASFALTADA

AREA ASFALTADA

**SCRAPE TOP 10CM OF LAUNCH RAMP & REPAVE.
 REPLACE STEEL REINFORCEMENT AS NEEDED
 (APPROXIMATELY 80 SQ.M.)
 SEE DETAIL-A**

BOAT RAMP PLAN VIEW

BASEPLAN SOURCE: PLANO TOPOGRAFICO PROPIEDAD
 ADQUIRIDA - MUNICIPIO DE RINCON BY SURVEYOR JUAN
 CARLOS DAVILA, PS

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 SUITE 200
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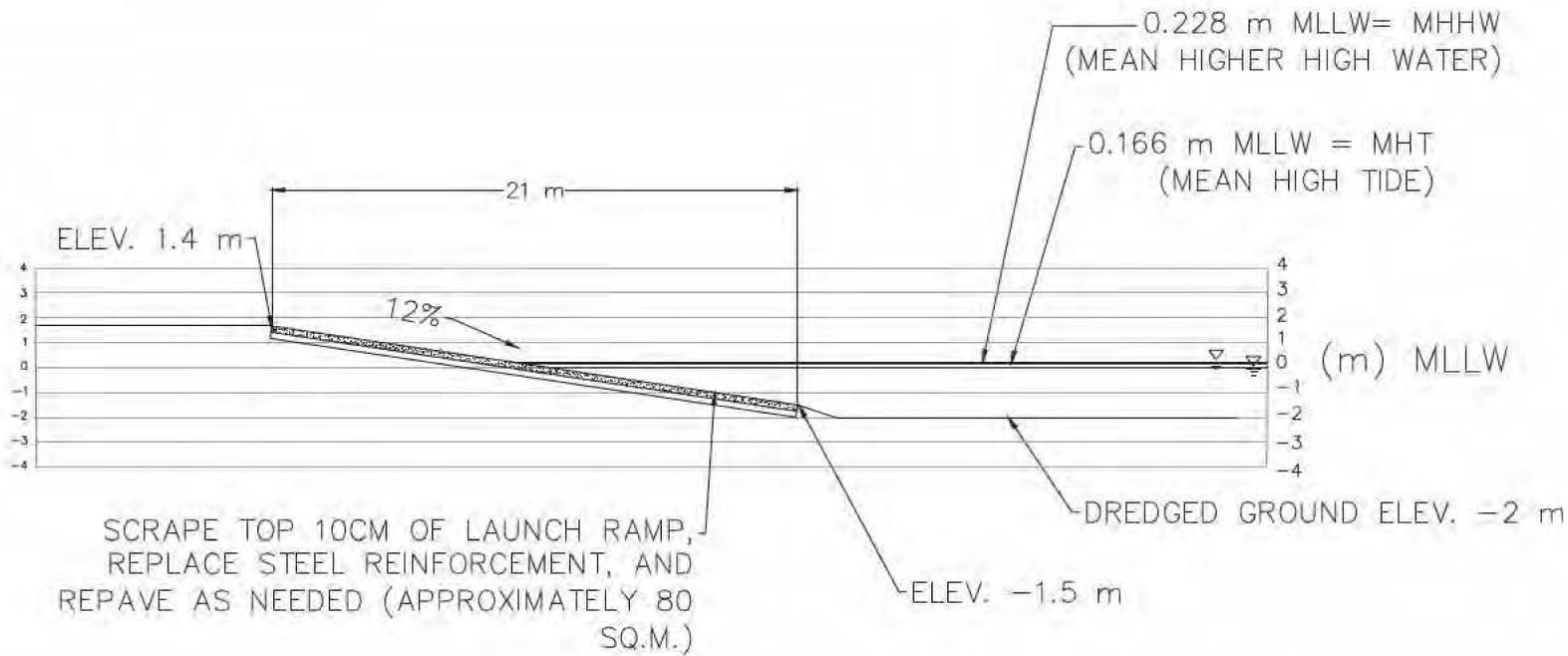


REV	DATE	DESCRIPTION
1	14-07-2018	ISSUED FOR PERMIT
2	17-09-2018	BOAT RAMP DETAILS ADDED

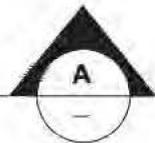


RINCON MARINA PROJECT
 RINCON MUNICIPALITY
 RINCON, PR
 BOAT RAMP PLAN VIEW

SHEET REFERENCE:
 SHEET 10 OF 12



BOAT RAMP SECTION



TETRA TECH
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 FAX: (787) 722-4561



REV	DATE	DESCRIPTION
1	11-09-2018	ISSUED FOR PERMIT
2	12-07-2018	BOAT RAMP DETAILS ADDED

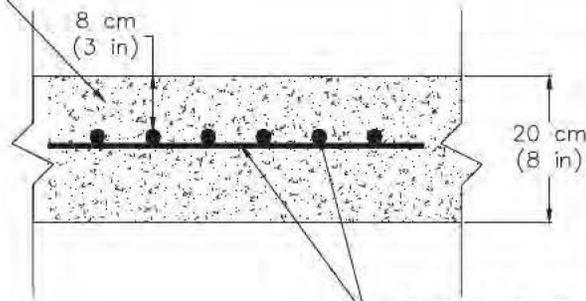
DESIGNED BY:	DATE:
DRAWN BY:	SCALE:
CHECKED BY:	PROJECT FILE NO.:
APPROVED BY:	DATE:



RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR
BOAT RAMP CROSS SECTION

SHEET REFERENCE:
 SHEET 11 OF 12

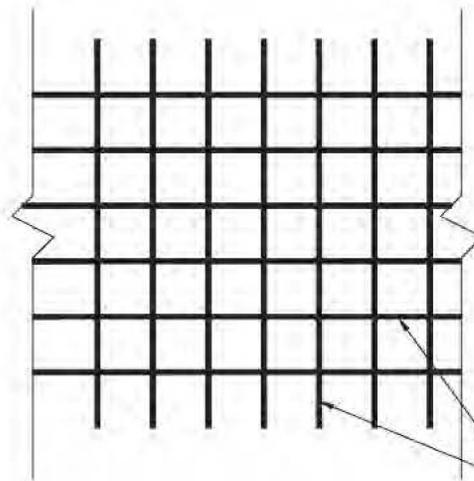
4,000 PSI PORTLAND
CEMENT: ASTM C150
TYPE 1



#4 BAR @ 30 cm (12 in)
O.C., E.W. SEE DETAIL-B

DETAIL-A: RE-BAR CONFIGURATION

NOT TO SCALE



REINFORCING STEEL SHALL
CONFORM REQUIREMENTS OF
ASTM A615, GRADE 60

#4 BAR @ 30 cm
(12 in) O.C., E.W.

DETAIL-B: CONCRETE REINFORCEMENT

NOT TO SCALE

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REV	DATE	DESCRIPTION
1	10/15/2018	ISSUED FOR PERMITS
2	10/15/2018	BOAT RAMP DETAILS ADDED



RINCON MARINA PROJECT
RINCON MUNICIPALITY
RINCON, PR
BOAT RAMP DETAILS

SHEET REFERENCE:
SHEET 12 OF 12