Preliminary Engineering Report (PER) for:

Marine Business Research, Innovation & Science Caribbean Center (M-BRIC) at Roosevelt Roads Re-development

Ceiba, Puerto Rico

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Submitted to:

GOVERNMENT OF PUERTO RICO
Local Redevelopment Authority
for Roosevelt Roads

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1) EXECUTIVE SUMMARY

The "Local Redevelopment Authority for Roosevelt Roads" (LRA) proposes major infrastructure improvements on the former Coast Guard building 2409, US Customs building 2262 and Coast Guard Pier. These improvements are part of the re-development of a group of land parcels conforming the former "Naval Station Roosevelt Roads". These group of parcels are located on the Machos, Guayacán, Quebrada Seca and Daguao Wards, in the municipalities of Ceiba and Naguabo, PR. After the United States Navy ceased military operations in Roosevelt Roads in 2004, the Government of Puerto Rico created the "Local Redevelopment Authority – Roosevelt Roads" (LRA) as the government agency authorized to promote the re-development at the former base.

The re-development of the former "Naval Station Roosevelt Roads" (NSRR or Roosevelt Roads) in Ceiba and Naguabo, requires the planning for a proper infrastructure support. Because of its age and prior uses, the existing facilities at former NSRR won't at mid and long term- optimally satisfy the predicted demands as defined by a Reuse Plan prepared by the LRA. By this mean, the existing facilities must be repaired, rehabilitated and/or reconstructed in order to satisfy the predicted demands.

The 2014 Development Zones Master Plan was prepared by the LRA and the 2014 "Plan Especial y Reglamento para el Redesarrollo de los Terrenos y Facilidades de la Antigua Base Naval de Roosevelt Roads, (ROTFU)" was prepared by the PR Planning Board as Reuse Plans to supplement and redirect the focus of the development to better leverage site opportunities, current market potentials and strategic economic development opportunities in order to temperate new economic and social conditions. After full build-up (in about 25 years), it is expected to create 21,000 jobs and bring $280 million from the construction and $600 million from the operation during the first 20-25 years. It will then support a mixed development of residential units, hotel rooms, combined lodging, retail, office and light industrial space.

In addition, the "2012 Roosevelt Roads Infrastructure Master Plan" was developed as a fundamental complement to the re-use plans. It provided the guidelines and cost projections for the entire shared infrastructure and major utility components. It also included an assessment of the existing conditions based on data supplied by the former occupants as well as from technical reports prepared by numerous professionals since 2004.

Based on current redevelopment conditions, the LRA and BLUETIDE (a nonprofit organization created in partnership with the Puerto Rico Science and Technology Research Trust (PRSTRT), operated independently and with its own board of directors) have the intention to optimize one key man-made assets currently available in Ceiba, PR at the Roosevelt Roads, former Naval Base, the Former Coast Guard Pier, which provide strategic

and cost-effective access to all the natural assets in the region. The post disaster recovery strategy for PR has included Ocean Economy as one of their economic recovery strategic initiatives, BLUETIDE Initiative (name which the organization borrowed to emphasize alignment) being in the forefront of this initiative as presented by the Economic Development Department of PR. The project consists in developing a new Marine Business Research and Innovation Center and the rehabilitation of the former Coast Guard Pier.

This report incorporates current data as well as the data contained in the "2012 Infrastructure Master Plan" and compares the assessed former Coast Guard building 2409, US Customs building 2262 and Coast Guard Pier, against the proposed projects (as per the 2014 Development Zones Master Plan and the 2014 Reuse and the Land Use Plan (ROTFU)) to determine the capacity and adequacy of each component.

2) **INTRODUCTION**

As presented in the 2014 Development Zones Master Plan prepared by the LRA and the 2014 "Plan Especial y Reglamento para el Redesarrollo de los Terrenos y Facilidades de la Antigua Base Naval de Roosevelt Roads, (ROTFU)" prepared by the PR Planning Board as Reuse Plans the main scope of the redevelopment is to have better leverage of site opportunities and strategic economic development opportunities in order to temperate new economic and social conditions. After full build-up (in about 25 years), it is expected to create 21,000 jobs and bring $280 million from the construction and $600 million from the operation during the first 20-25 years. It will then support a mixed development of residential units, hotel rooms, combined lodging, retail, office, and light industrial space.

During the extremely natural events of September 6, 2017 until September 20, 2017, Hurricane Irma and Maria affected the former "Naval Station Roosevelt Roads" (NSRR or Roosevelt Roads) located in the Municipalities of Ceiba and Naguabo. The NSRR infrastructures, utilities, roads, piers, among others were severely affected by the hurricanes. Some of the several buildings that were affected were the former Coast Guard building 2409, US Customs building 2262 and Coast Guard Pier, which are located at the end of Kearsage Road.

The former US Coast Guard facility (building No. 2409) consisted of a closed steel structure with a total area of 5,795 square feet. The former US Customs Building (building No. 2262) consisted of a wood trailer type structure with a total area of 2,080 square feet. The subject property components including the former Coast Guard Pier presented damages caused by the weather phenomenal, such as: affected and damaged building exteriors and interiors, mechanical equipment, electrical systems, illumination, windows, doors, bathrooms, parking and Coast Guard Pier elements and components. The proposed project consists in the construction of a new Marine Business Research & Innovation Center at the location of the former Coast Guard facility and US Customs building. Since both structures presented severe damages, they are intended to be demolished in order to construct the proposed new M-BRIC Building (Marine Business Research & Innovation Center). This new Center will occupy an approximate area of 42,866 square feet and 35 parking spaces with security control, loading and unloading area and waste/garbage area.

Currently this area presents a key man-made asset to provide strategic and cost-effective access to all the natural assets in the region. The creation of a Field Station Marine Laboratory and Business Innovation Center located in Ceiba, PR, is the fundamental asset for this initiative at regional level and will serve the Caribbean as well as internationally. Creating the opportunity to incubate transformational next-generation businesses that can provide PR access to economic opportunities, diversifying Puerto Rico's economy and position the Caribbean islands (PR and USVI) as an international Blue Economy knowledge hub. This

Center focuses on the Island's natural assets, creating new businesses, and developing PR's capabilities to insert its industrial base in eco-responsible and rapidly growing international market. The proposed Center will provide state-of-the-art infrastructure, knowledge base networking opportunities through on-site researchers, international collaboration, and exchange environment to foster innovation, and provide economic development policy direction.

In order provide a feasible and appropriate alternative for the project, a Preliminary Engineering Report (PER) is presented here. The Preliminary Engineering Report (PER) evaluates the project's scope feasibility, by considering and evaluating the improvements required to construct a new Marine Business Research, Innovation & Science Caribbean Center and rehabilitate the existing Coast Guard Pier. The analysis and evaluation will consider different parameters and factors such as: project development cost, environmental & social impacts, operation & maintenance, sustainability, and constructability among others.

3) **PROJECT PLANNING**

a) Location

The former Naval Station (NSRR) is located at the municipalities of Ceiba and Naguabo. It is bounded on the North by the various public lands and the access road from State Road PR-3; on the South by various conservation zones on public lands; on the East by Medio Mundo Passage, Bahia Ensenada Honda, and Bahia de Puerca; and on the West by State Road PR-53 and Jose Aponte de la Torre Airport.

Figure 1 Geographic Location

The area under consideration for this project is located inside the NSRR premises at the Municipality of Ceiba portion, The geographic location on an aerial photo and on a topographic map and are shown on Figure 1 and Figure 2, respectively. The existing facilities are shown on Figure 3 Aerial Photo.

Based on the 2014 Development Zones Master Plan, the project area is located on development Zone C (subzone C5). The Zone C Area is known as ‘’The Green Belt’’ the area consists in 888-acre development zone composed of six separate parcels. Ensenada Honda Lowlands Trails, boardwalks, parkland, former US Coast Guard wharf (pier) (reuse as commercial /tourism pier). Refer to Figure 4 - Re-development zones (2014 Master Plan), and Figure 5, Subzone C5.

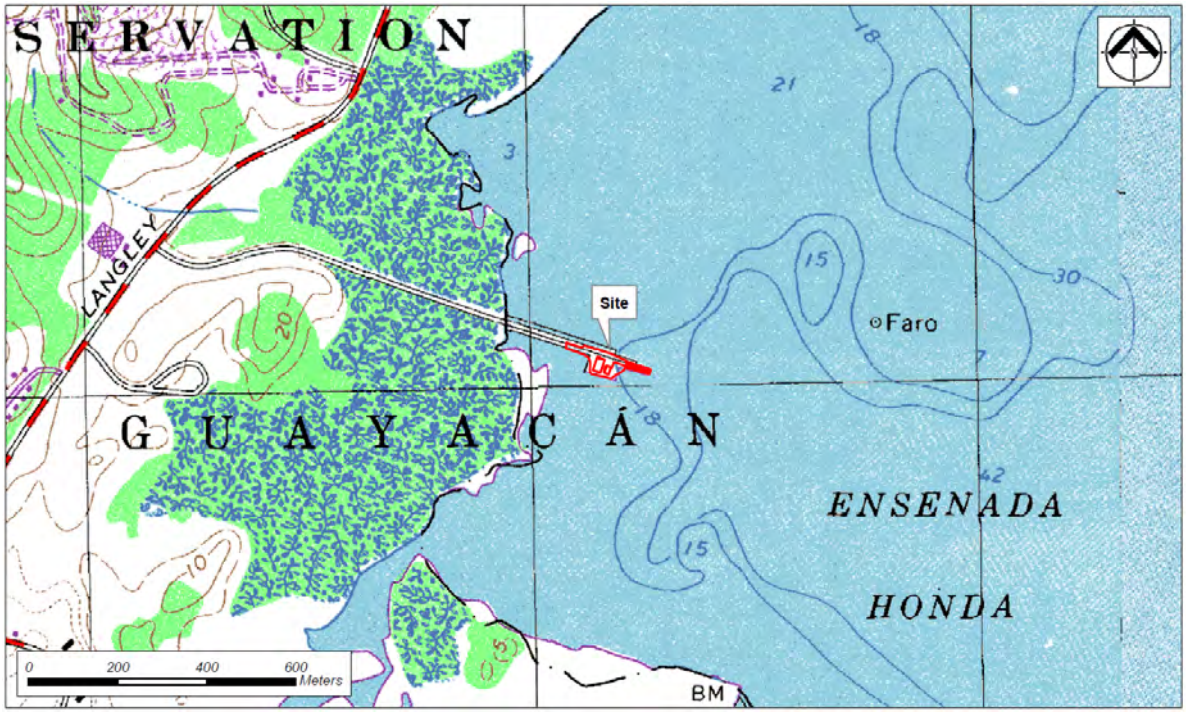
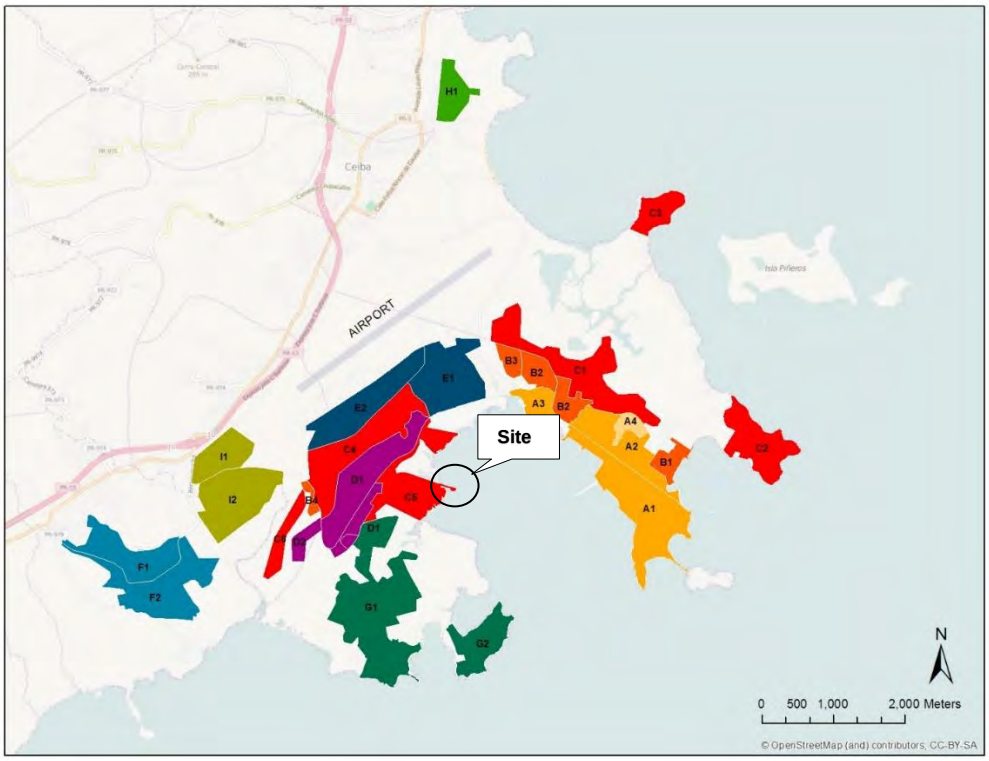


Figure 2 Location Map- USGS Topographic Map

Figure 3 Aerial Photo



Site

Figure 4 Re-development zones (2014 Master Plan)

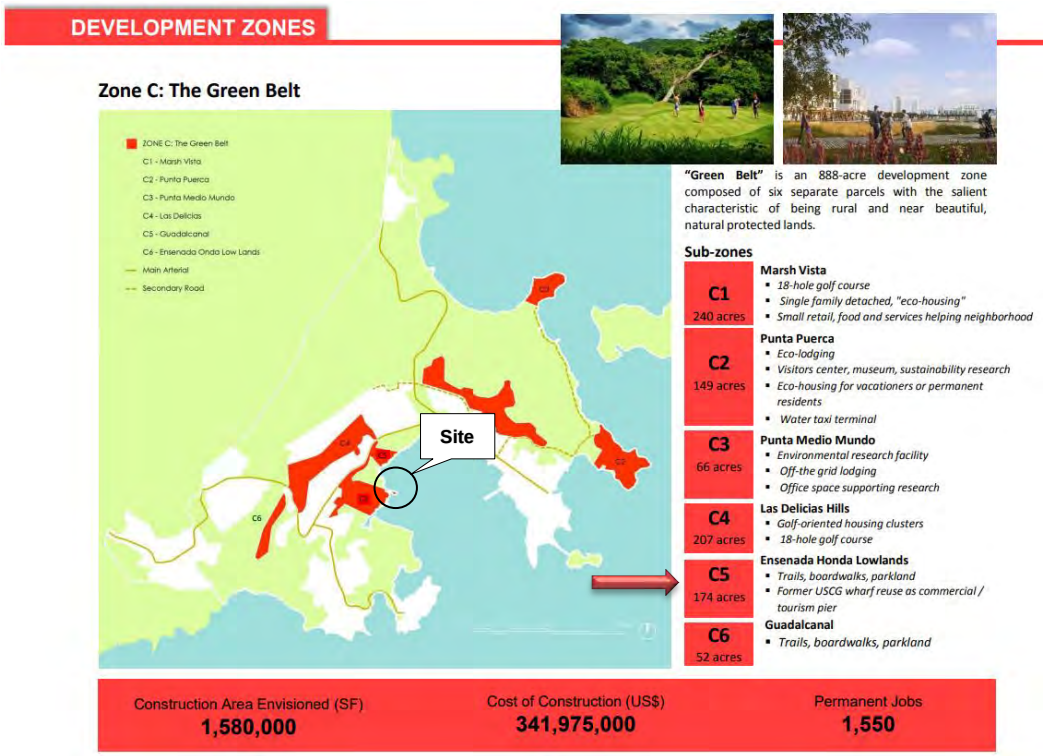


Figure 5: C5 Development Sub-Zone

b) Environmental Resources

The proposed project will be located within a suburban improved area, which is mainly comprised of existing roads and developed commercial /industrial areas. The environmental resources that are located within the area to be impacted are described as follows:

i) Flood Areas

Figure 5 (FEMA Flood Map) shows the susceptibility areas of flooding for the proposed project. Due to the location of the site, the current maps with effective date April 13, 2018, applied to this project is the 72000C1285J.

The Former Coast Guard Facility (building No. 2409) and the former US Custom building 2262 which is intended to be demolished in order to construct the new Marine Business Research, Innovation & Science Caribbean Center are located at zone VE. Base Flood Elevations or depths within this zone is defined in the flood map, refer to Figures 6 and 7. In this location the recommended base flood elevation is 5.20 meters.

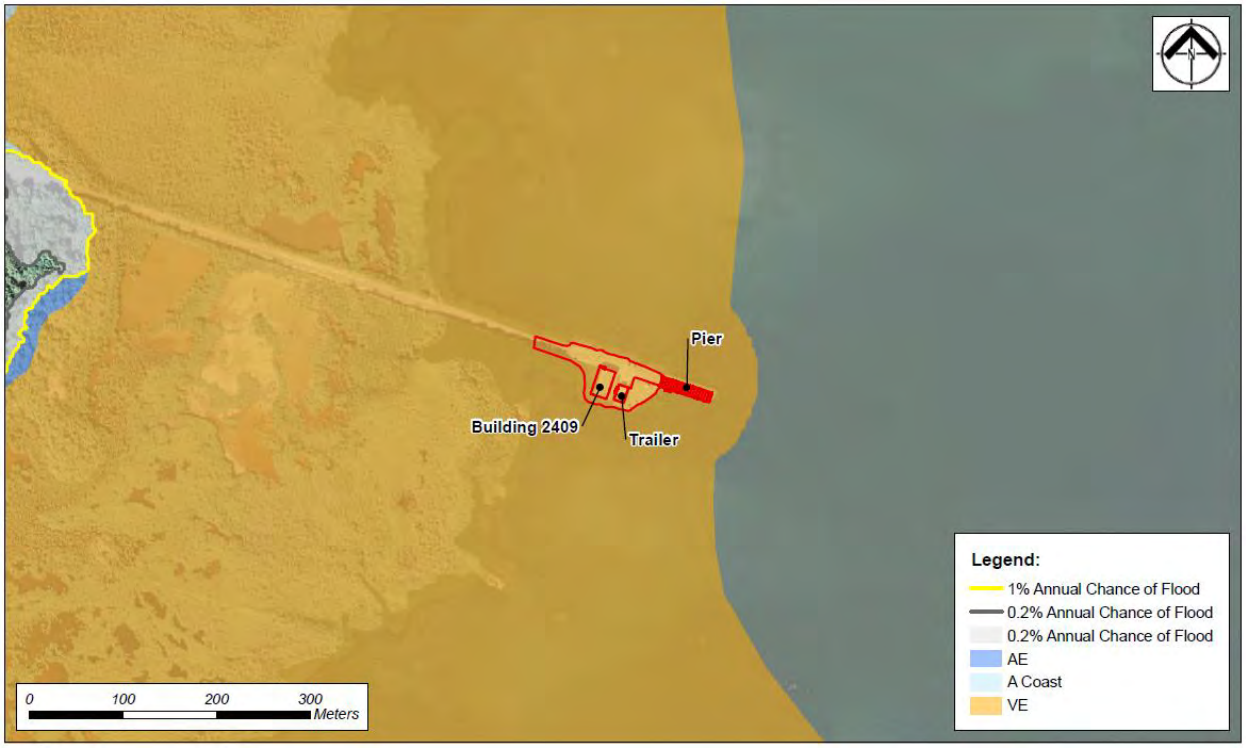


Figure 6 FEMA Flood Maps
Maps Number: 72000C1285J

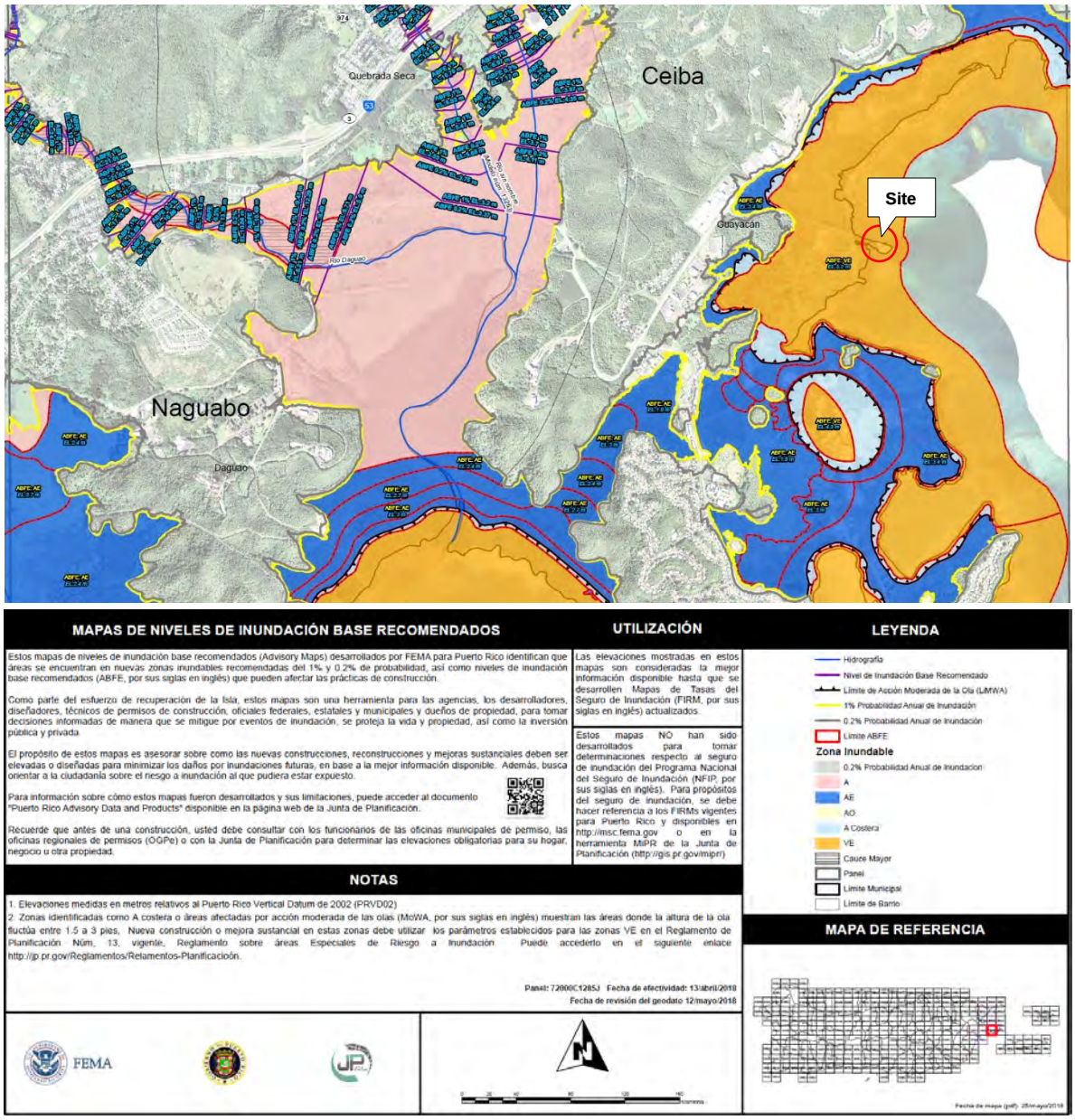


Figure 7: FEMA Flood Map
Maps Number: 72000C1285J

ii) **Soils**

As shown in Figures 8 according to the soil survey, prepared by the USDA Natural Resources Soil Conservation Service, the primary types of soils within the project area consist of: Tidal Swamp (TS).

Figure 8 Soil Survey

iii) Geology

As shown in Figure 9, the formations within the proposed project as reported by United States Geological Survey (USGS) does not have an identified geologic formation. The adjacent project areas consist of: Swamp Deposits (Qs).

Figure 9 Geological Map

iv) Preservations Areas and Archaeology

The Navy conducted station-wide archaeological surveys in three phases from 1994 through 1996. More than 25% of the Naval Station was surveyed as part of this initiative, resulting in the identification of 27 archaeological sites. An additional four sites were identified during a survey conducted in the summer of 2004. Of the 31 sites identified to date that lie within the former base, 19 sites have been determined to be eligible and three sites are classified as potentially eligible for listing in the NRHP. The remaining sites have been determined to be ineligible for listing. The remaining acres at the installation, which were identified as being relatively undisturbed and having a moderate to high potential for the presence of archaeological resources, were surveyed in mid-2005. The proposed project will not impact any identified preserved historic or archeological areas. See archeological sites on Figure 11.

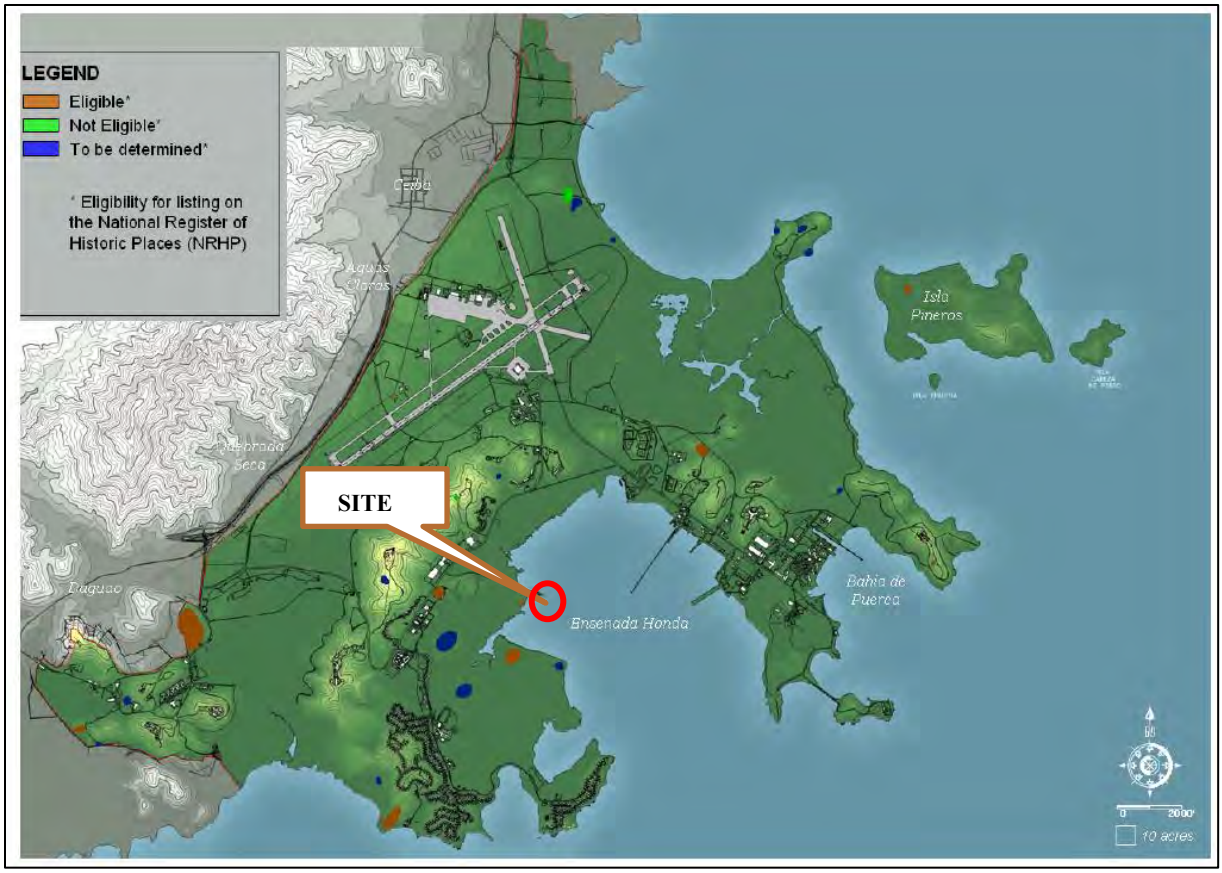


Figure 10 Archaeological site Map

v) Surface Waters and Groundwater

Based on the Groundwater Resources Map, the location where the project is proposed is described as a and area with no groundwater resources. The reconstruction and development of a new Marine Business Research and Innovation Center will not have a potential to result in impacts on groundwater recharge and discharge and on water quality. Currently the surface water in the location and near areas of the proposed project are being managed by surface sheet flow. The building's runoff water generated will discharge south into the Ocean. The increase of surface water to be generate by the project will be minimal and will considered to be managed in the final design of the project. With implementation of best management practices during construction and storm water treatment measures, construction and operation of the facilities are not expected to result in significant adverse impacts on surface water.

The wastewater to be generated by the operation of the new Marine Business Research and Innovation Center will be contained in new manhole to be constructed that will then discharge to a new lift station with the purpose to discharge the generated wastewater to the existing gravity sewer system at Langley Drive. The wastewater will eventually go into the pit of the

existing lift station 1971, which is currently out of operation. The water will then be empty with vacuum trucks by the LRA personnel and transported for final treatment at the Puerto Rico Aqueduct and Sewer Authority (PRASA) Fajardo WWTP, because there are no currently operating wastewater treatment facilities on the premises. Figures 11 & 12 shows the surface and groundwater resources of the area of the proposed project.

Figure 11 Groundwater Resources Map

Figure 12 Surface Water Resources Map

vi) Land Use

As shown in the Land Use Map, figure 13, the land uses defined in the "Mapa del Reglamento de Ordenacion de los Terrenos y la Forma Urbana de la Antigua Base Naval de Roosevelt Roads (ROTFU)" published by the PR Planning Board, effective date October 3, 2014, the location of the new Marine Business Research & Innovation Center project comprises a (SRC*) ''Suelo Rustico Común''* use and the district classification is E-2 *''Distrito Especial Rural''*. The proposed land uses defined by the PR Planning Board are similar to existing land use in terms of developed and undeveloped zones. The E-2 classification is defined as open spaces, coastal areas, or land used to wind farms or solar panels. In this district is allowed the construction of very low-density structures, mostly dedicated to recreational or tourist activities according to the permitted uses. Some of the permitted uses are the following: Investigation Facilities, Ecologic Hotels and Resorts, Publics and Recreational Installations, Agroindustry among others.

The project will not have a direct impact during construction works and during operation of the current land uses. No changes in land uses are considered as the proposed project uses (Investigation facilities) will be compatible with the current permitted uses

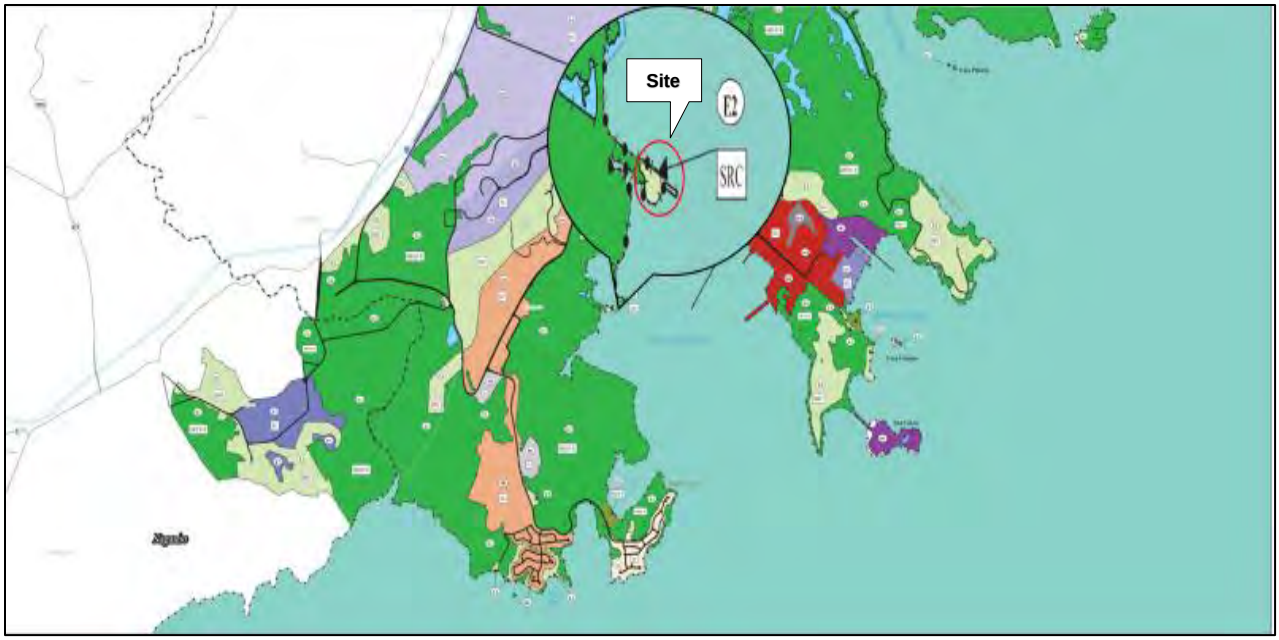


Figure 13 Land Use Map (ROTFU-PR Planning Board Zoning)

vii) Environmental Areas of Concern & Solid Waste Management Units

The Navy has conducted a series of Environmental Condition of Property (ECP) Assessments. The effort focused on all available information pertaining to current and past uses of the property, specifically focusing on activities that might pertain to the use, storage, release, or disposal of hazardous substances and petroleum products or their derivatives. The ECP report identified a mature installation restoration program (IRP) at the facility administered under a Resource Conservation and Recovery Act (RCRA) Part B permit specifying corrective action. A permit renewal application was submitted in 2004 that proposes updated actions based on progress to date. The sites are in various stages of study and cleanup, ranging from preliminary investigation to remedial action complete.

The proposed development of the Marine Business Research & Innovation Center is located outside but near environmental concern sites. The identified environmental concern sites adjacent to the project area are denominated as SWMU 1 and AOC D. The SWMU (Solid Waste Management Unit) 1 is described as a former Army Cremator Disposal Site. This site was in operation from the 1940s to the 1960s and consists of an abandoned, unlined landfill. According to the EPA (Environmental Protection Agency) an estimated 100,000 tons of waste including scrap metal, inert ordnance, batteries, tires, appliances, cars, and others solid waste were disposed at this unit. Therefore, no contaminants were detected in surface soil or subsurface soil. Groundwater Quality at SWMUs have groundwater contaminant concentrations in excess of relevant groundwater standards. Meanwhile, the report presented

by the NAPR Cleanup Program Sites Under RCRA in June 2021, presented the current status for SWMU 1 is currently undergoing the RCRA Facility Investigation/Corrective Measure Study. The AOC (Area of Concern) D site is described as Ensenada Honda Sediments. This site according to the Status of NAPR Cleanup Program Sites Under RCRA in June 2021, reported the current status of AOC D is in Site Closure, that means that all corrective action was complete for this site. Corrective Action Complete determination is issued when investigations are complete and contamination levels are reduced to applicable levels. Corrective Action Complete determinations may be made "with" or "without" controls in place. The approved controls may be engineered controls such as waste treatment or containment and/or administrative controls such as land or water use controls. Otherwise, the M-BRIC project area location is near but outside of the environmental sites and one of these sites status is under corrective action complete. The Solid Waste Management Unit (SWMU 1) and Area of Concern D (AOC D) are shown on Figure 14.

To prevent unacceptable risks to human health and the environment, the Navy included the following land use controls on those concern areas:

SWMU 1

- Unexplode Ordinance escort to access the property
- Non-Residential Use Only
- Surface Soil and Subsurface Soil Access and/or Activity Restriction
- Sediment Access and/or Activity Restriction
- Groundwater Use and Well Installation Restriction

Contaminant(s) of concern: MEC, Metals, Dioxins, Pesticides, SVOCs, VOCs

AOC D

- Corrective Action Complete without Controls
- Limitations: Endangered or Threaten Species: Sea Turtle Habitat

The proposed project area will not impact SWMU 1, as a fence will be installed during the construction and operational phases to prevent any intrusion into that area. Proper signage will be installed on the fence to provide warning and notifications of the environmental limitations on that property limit.

In addition, no improvements activities are expected on underwater areas on AOC D.

Figure 14 Environmental Concern Areas & Solid Waste Management Units

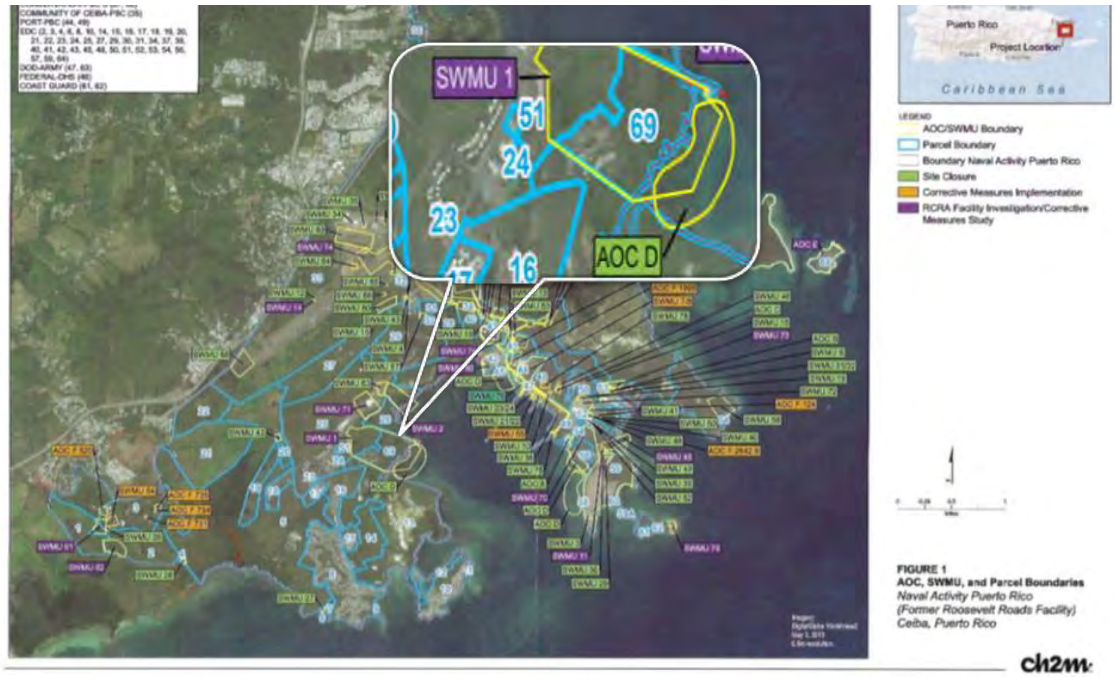


Figure 15 Status of NAPR Cleanup Program Sites Under RCRA

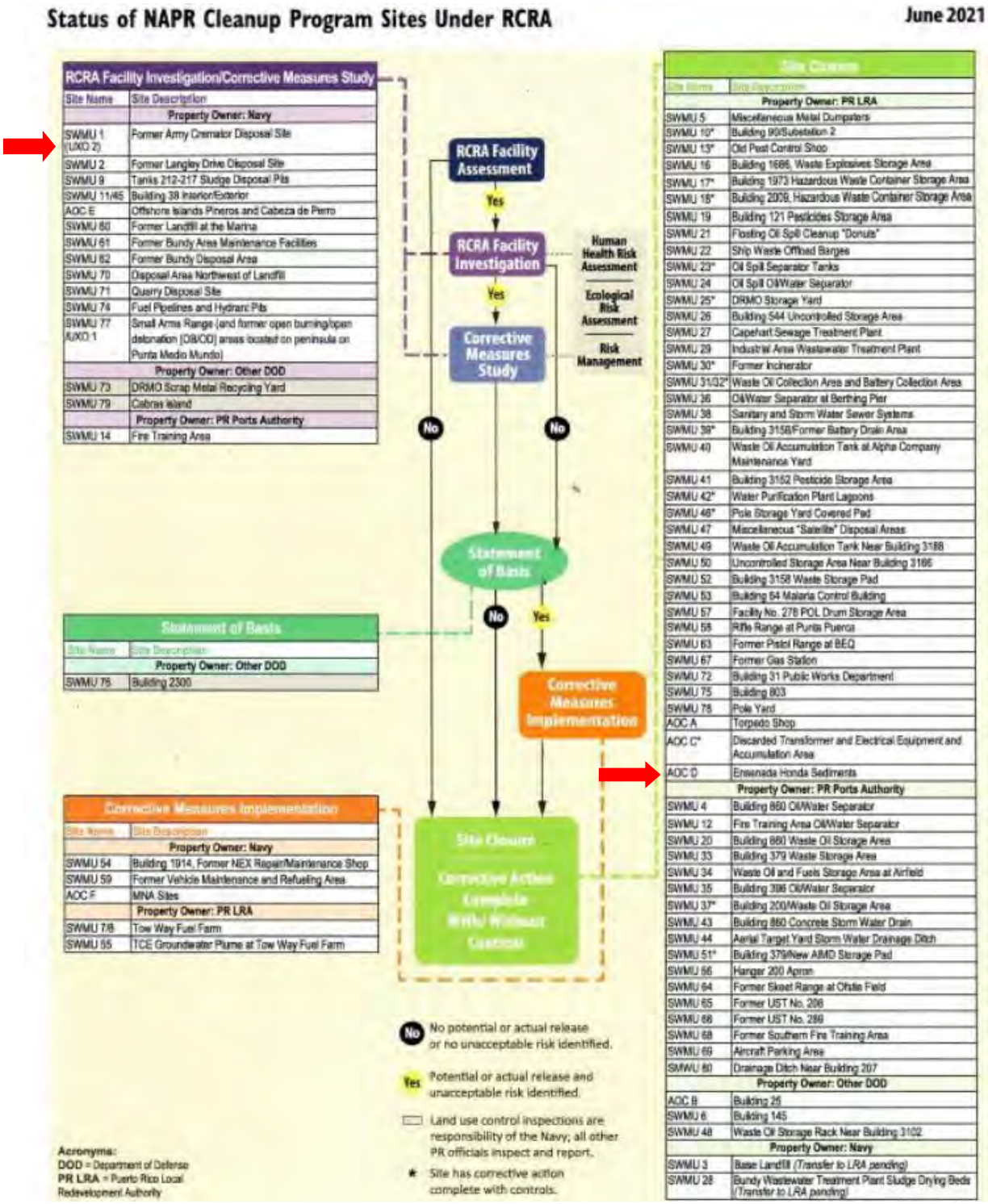


Figure 16: Status of NAPR Cleanup Program Sites Under RCRA

viii) **Vegetation**

The coastal area of Puerto Rico near Ceiba, including NSRR, is classified as a subtropical dry forest ecological life zone (Ewel and Whitmore 1973). Historical land use of the property, which has included grazing and development associated with NSRR, has led to the replacement of the historic climax upland community with scrub/forest communities. Approximately 2,500 acres of land at NAPR have been developed. The remainder of the base comprises unimproved (4,500 acres) and semi-improved (1,400 acres) areas with various terrestrial, marine, and transitional communities (U.S. Navy 2004).

Terrestrial communities at NAPR include coastal scrub forest, upland coastal forest, grassland, and freshwater wetlands (wet coastal scrub forest and wet meadow). Wetland communities—transitional areas between marine and terrestrial environments—have been divided into freshwater and tidal wetland communities. Mangrove forests comprise about 2,100 acres of NAPR (U.S. Navy 1996), approximately 25% of NSRR. One plant federally and Commonwealth-listed as a threatened species is known to occur at NAPR. The Cobana negra (Stahlia monosperma), is a medium-sized evergreen tree that reaches 25 to 50 feet in height and 1 to 1.5 feet in diameter. It is found on the edge of salt flats in brackish, seasonally flooded wetlands. Critical habitat has not been designated for this species (USFWS 2011e). A Cobana negra tree was identified in a mangrove stand near the Coast Guard (old ammunition) pier in Ensenada Honda in 1989 (Vicente et al. 1989). Rare species surveys were conducted at FNAPR in August 2004 and identified a single individual of this species in a coastal scrub forest area west of American Circle (NAVFAC LANTDIV 2006).

The proposed improvements will be located outside but near Conservation Zone No. 26 and vegetated areas. The project location will be concentrated in the Former USGS Coastal Guard Pier area which consist mainly of small, developed area and a Pier, refer to Figure 17. Since the access road to reach the project site is located adjacent to Conservation Zone 26 and vegetated areas, proper precaution must be taken to access heavy machinery if required. Freshwater wetlands are located adjacent to the project location. As for the construction of the project, effective erosion control measures are needed to prevent sedimentation and contamination. No temporary or permanent effect on sensitive vegetation areas is expected due to the proposed improvements.

Is important to emphasize that one plant has been identified as threatened species, the “Cobana Negra”. Any proposed development where this plant is encountered, measures to protect this specie must be implemented.

Figure 17 Conservation Areas

ix) Wildlife

Wildlife at NSRR comprises multiple native reptiles, amphibian, and avian species as well as a host of introduced mammal species. Threatened and endangered species are typically found primarily in less disturbed and more unique communities. Federally listed and Commonwealth-listed plant and animal species found at NAPR are includes one Mammal species (west Indian Manatee), 6 Reptiles species (PR Boa, Turtles, etc.), and 10 Bird species (Yellow-shouldered blackbird, etc.).

Threatened and endangered species location areas and conservation measures are defined in the report "Parcel Map for the Disposal of Naval Activity Puerto Rico" (U.S. navy 2005). The conservation measures require the consultation with the U.S. Fish and Wildlife Service regarding all development plans on the identified areas. Also, it requires that some development, construction and maintenance activities be restricted on a seasonal basis and to maintain a buffer distance from sensitive areas. For developments near sea turtle nesting beach areas, it requires to implement precautionary measures before, during, and after development activities. For Yellow-shouldered blackbird nesting areas, visual inspections must be performed in order to identify any nesting on buildings, structures, and trees.

The proposed improvements will be located outside and distant of designated natural zones where endangered species can be found. Even though the area is not a designated natural zone of endangered species, if endangered species such as Yellow-shouldered Blackbird nesting areas, construction activities shall be performed with restrictions in order to prevent, the intrusion of heavy equipment and personnel into those sensitive areas. No effect on threatened or endangered wildlife is expected due to the proposed improvements. The concern areas are shown on Figure 18.

Figure 18 Threatened Wildlife Habitat Locations

c) Community Engagement

As part of the re-development efforts since the base closure in 2004, the surrounding communities in Ceiba and Naguabo have been informed of the re-development plans. The LRA has engaged the communities through a series of public hearings, meetings, educational workshops, presentations, and participative committees.

In order to ensure community representation in the planning and redevelopment of the property, and pursuant to an executive order by the Governor of PR, the LRA Board of Directors includes the appointment of two residents of Ceiba, and one of Naguabo to the Board of Directors, the entity tasked with working with the LRA in developing a reuse plan.

In addition, the Mayors of Naguabo and Ceiba are also members of the Board. In order to address community concerns and to ensure local participation, the Board created subcommittees that were to be principally composed of residents of Ceiba and Naguabo. The subcommittees created included: Planning and Property Uses, Environment, Housing and Homeless, Human Resources, Economic Development, Infrastructure, Health and Education. Multiple citizens from the Eastern region of Puerto Rico actively participated in the sub-committees, providing insightful and enthusiastic policy recommendations and suggestions related to the future of the former base. In order to understand the communities existing needs, since 2004 and continuously, the LRA also made numerous trips and visits to the area to meet with community leaders, community organizations, displaced workers, industry leaders, local stakeholders and other affected parties.

4) EXISTING FACILITIES

a) History

President Franklin Roosevelt ordered the construction of the facilities located in Roosevelt Roads in 1940. It was completed in 1943 and Roosevelt Roads was commissioned as a U.S. Naval Operations Base. One of the components of this U.S. Naval Operations Base was the Main Waterfront. The main waterfront is located around Ensenada Honda harbor and is approximately 160 acres in area. Ensenada Honda has 1,000 feet long and 40 feet deep navigation channel, adequate for large vessels access. Other existing facilities on the site include a wide range of existing buildings left behind by the Navy. The main piers have varying depths from 32-to 44 feet depth and 15 feet depth on the bulkheads.

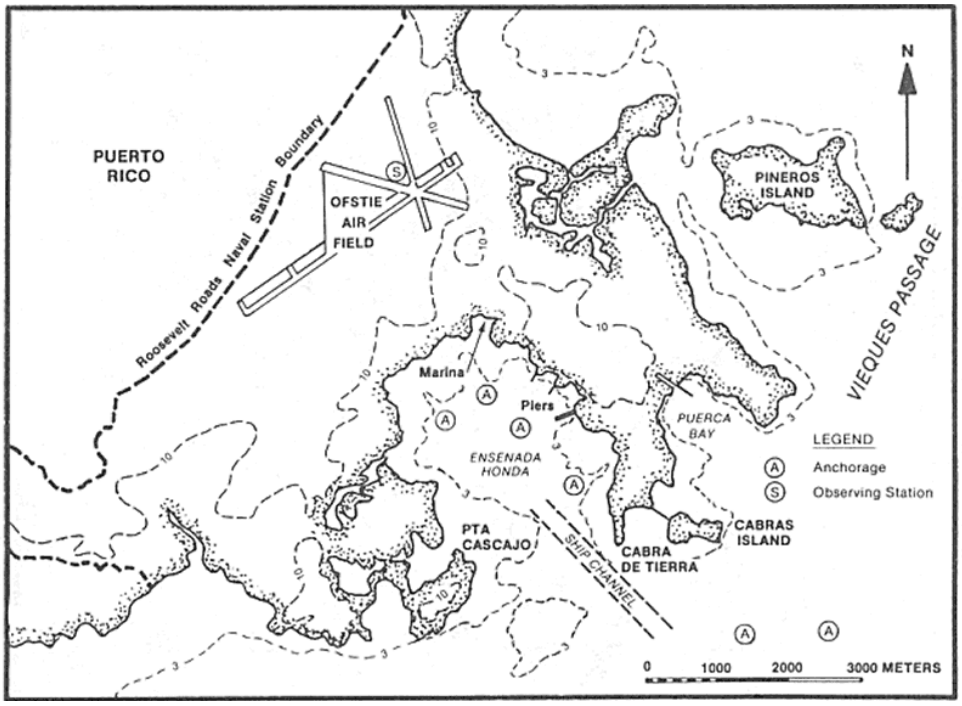


Figure 19 Former Naval Base Map

i) Coast Guard Facility (building No. 2409) and US Customs Building 2262

The Coast Guard Facility and US Customs Building were constructed in 1987. Both buildings are currently damaged and unsafe to be operational. In the past, these buildings compromised different uses for the Coast Guard and US Customs. Currently these buildings are abandoned and partially destroyed.

ii) **Coast Guard Pier**

Roosevelt Roads have a variety of piers used for different purposes. The main piers are located at the main waterfront around Ensenada Honda these piers are 1000 feet of long and deeper than 40 feet. One of the piers located inside Ensenada Honda but distant from the main waterfront is the former Coast Guard Pier.

The Coast Guard Pier was constructed in 1943. This pier has a length of 184 feet long and a width of 35 feet. The Pier currently presents a series of damages that affects the operational use of the pier, although the pier is currently not in operation.

b) Existing Facilities Conditions

i) **Coast Guard Facility Building**

The former Coast Guard Facility Building (Building 2409) is located at Ensenada Honda harbor on the end of Kearsage road. The building consists of a steel hangar type structure with an area of approximately 6,000 square feet. The site of the property encompasses a parking lot area, a trailer type structure (denominated as US Customs Building 2262) and a concrete-deck pier (denominated as Coast Guard Pier, refer to Appendix A, B and C for the site plan and building's drawings. The parking lot area have capacity for approximately 23 spaces and is located northside of the facility. In the past, the building compromised different spaces for the use of the Coast Guard personnel. The building is currently deteriorated, partially collapsed, abandoned and unsafe to be operational. The conditions of the components of the building such as electrical, water and sanitary utilities located underground cannot be easily addressed, although based on collected data, major repairs and improvements will be required to be performed.

From the assessed analysis, the main findings were:

- The structure main structural steel components were observed in bad condition (collapsed elements, loss sections and signs of mild to severe corrosion).
- Most of the structure elements and components such as columns, beams, metal siding, metal roofing, purlins, extraction fans, windows, roll up doors and lighting fixtures were severely damaged. These components were extremely affected by hurricane Irma and Maria in 2017.
- All interior spaces were observed damaged, destroyed, or missing. The deficiencies of these spaces were observed to be caused primary due to hurricane Irma and Maria in 2017.

Figure 20 Coast Guard Facility Building (eastside view)

Figure 21 Coast Guard Facility Building (southside view)

Figure 22 Coast Guard Facility Building detached column (southside view)

Figure 23 Coast Guard Facility Building buckled column (southside view)

Figure 24 Coast Guard Facility Building (westside view)

Figure 25 Coast Guard Facility Building's elements severe corrosion

Figure 26 Coast Guard Facility Building's damaged siding and insulation

Figure 27 Coast Guard Facility Building's severely corroded column

Figure 28 Coast Guard Facility Building's detached metal roofing

Figure 29 Coast Guard Facility Building's damaged interior

Figure 30 Coast Guard Facility damaged wastewater lift station 2262

In general, the building presents severe damages and approximately more than 50% of its components are damaged or affected. Due to the extent of the observed damages, is more feasible to demolish the structure's remaining components and rebuilding a new structure on the existing floor slab. In order to use the remaining components, excessive rehabilitation works must be performed and may easily have a higher cost impact.

ii) US Customs Building (Building 2262)

The former US Customs Building (Building 2262) is located at Ensenada Honda harbor on the end of Kearsage road at the east side of Coast Guard Facility Building (Building 2409). The building consists of a wood trailer type structure with an area of approximately 2,080 square feet. The site of the property encompasses a parking space, former Coast Guard Facility Building (Building 2409) and a concrete-deck pier (denominated as Coast Guard Pier), refer to Appendix A, B and C for the site plan and building's drawings. The parking area has room for approximately 5 spaces located northside of the facility. In the past, the building compromised different spaces for the use of the US Customs personnel. The building is currently deteriorated, abandoned, and unsafe to be operational. The conditions of the components of the buildings such as electrical, water and sanitary utilities located at the inside partition walls or underground cannot be easily addressed, although based on collected data, major repairs and improvements will be required to be performed.

From the assessed analysis, the main findings were:

- The building main structural wood elements were observed in fair condition.
- Most of the structure exterior components such as wall mounted A/C units, wood siding and windows are currently damaged. These components were extremely affected by hurricane Irma and Maria in 2017.
- The interior spaces components such as insulation, acoustic ceiling tiles, electrical components (cables, panel boards and lighting fixtures) and bathroom were observed damaged, destroyed, or missing. The deficiencies of these spaces were observed to be caused primary due to hurricane Irma and Maria.

Figure 31 US Customs Building (westside view)

Figure 32 US Customs Building (southside view)

Figure 33 US Customs Building (eastside view)

Figure 34 US Customs Building (northside view)

Figure 35 US Customs Building damaged interior components

Figure 36 US Customs Building damaged interior components

Figure 37 US Customs Building damaged interior components

Figure 38 US Customs Building damaged interior electrical components

Despite the observations, the structure is required to be demolished in order to construct the New Marine, Business Research Innovation Center. Even though if the structure was planned to be rehabilitated, it is considered that the building is not safe for occupation or to comply with current construction codes. Also, the building will require extensive electrical, mechanical, and interior rehabilitation works. As for the scope of work of the project it is more feasible to demolish the structure and reconstruct a new structure with more resilient elements and component in order to assure a longer "life span" and the safety of the structure.

iii) Coast Guard Pier

The Coast Guard Pier is located inside Ensenada Honda but distant from the main waterfront. This pier has a length of 184 feet long and a width of 35 feet. After Hurricanes Irma and Maria in 2017, US Department of Transportation (DOT) Maritime Administration (MARAD) performed structural assessments and cost estimates for the repair of piers and Bulkheads including the Coast Guard Pier (Task 005 Structural Assessment of Former US Coast Guard Pier Report Dated 28 March 2018). Also, a feasibility analysis for future developments were performed by MARAD. The pier was observed in average conditions based on the structural component's conditions. Although these structural components were not observed with critical damages, some elements presented immediate attention deficiencies such as exposed rebar sections. Currently the pier has other deficiencies caused majorly by the pass of hurricane Irma

and Maria. Some of these other deficiencies includes erosion and collapsed asphalted section in the pier start, refer to figures 39 to 43.

In the other hand, despite the existing Coast Guard Piers condition it is considered feasible to rehabilitate the structure. The estimated cost for the rehabilitation of the Coast Guard Pier structure is approximately $1,377,000.00 (from MARAD report). This cost is not part of the Marine Business and Innovation Center project. The pier structure will complement and benefit the New Marine, Business Research and Innovation Center proposed uses. Incorporate the Coast Guard Piers renovations can benefit the new M-BRIC development providing access to the sea with the advantages of having wharfage, a dockside crane, and on-site vessel storage.

Figure 39 Coast Guard Pier and Access

Figure 40 Coast Guard Pier

Figure 41 Coast Guard Pier damaged asphalted section (exposed PVC water line)

Figure 42 Coast Guard Pier damaged asphalted section

Figure 43 Coast Guard Pier damaged railing

5) NEED FOR PROJECT

a) Educational & Economic Benefits

The Marine Business Research and Innovation Center goal is incorporate the research, educational and touristic components, developing a facility with multi-use, multi-tenant use at an inclusive ocean industry network hub location that will utilize the collaborations of the US Caribbean Partner Network. A thriving Innovation Center will create an economic development epicenter stimulating innovation, business acceleration and economic growth to the region. This project can be able the access for Education, Public Awareness, and Community integration. The principal categories for the M-BRIC are promote the studies in the area of Ocean Engineering, Enhance Technology Driven Fisheries Management and Expand Ocean Product Development. The proposed M-BRIC Building will include a large portion for generic office space that is flexible and adaptable, easily reconfigurable for different sized tenant groups will help create a good mix of research, product development, business and innovative. The overall operation of the center will provide work opportunities for 38 researchers.

b) Location Strategic Advantages

Benefits to locating the Marine Research and Innovation Center in this location is the direct access to the water (sea). The site offers the advantages of having wharfage, a dockside crane, and on-site vessel storage. In the same way, the area provides the space to build an exterior lay-down/staging areas that would include space for trailers shipping containers, interior staging areas and a loading dock. Its highly central location on the waterfront would draw a significant percentage of visitors to Roosevelt Roads and the MBIRC and such a staffing function would enable cross-marketing of other attractions around.
Undoubtedly, the building structure above water is beneficial for lab to water transfer of equipment and water to lab transfer of large/heavy samples/equipment/supplies. The new M-BRIC Building at this location embraces the Ocean and the Blue Economy highlighting the ethic of sustainability, conservation, and restoration.

c) Reasonable Growth

The need to provide the capacity to satisfy expected and future demands of the Roosevelt Roads redevelopment, is an essential factor to be considered in all the new projects to be developed. This project has the function to serve as a regional Iconic Landmark - futuristic local attraction, engaging the local community and stimulating STEM and STREAM education. Currently the area is unoccupied, therefore is an incredibly opportunity to utilize Roosevelt Roads amenities elaborating the new Marine Business Research and Innovation Center. For the new M-BRIC development an analysis to estimate the expected and future infrastructure demands will be performed in order to design the structure and components of the development accordingly.

6) PROPOSED PROJECT

a) Introduction

As part of the "*2014 Roosevelt Roads Development Zones Master Plan*" and the "*Plan Especial y Reglamento para el Redesarrollo de los Terrenos y Facilidades de la Antigua Base Naval de Roosevelt Roads, (ROTFU)*", some rehabilitation and construction projects have been already completed. Although, based on the master plan there is still plenty of work and projects to be completed in order to fulfill the projected development of the entire facility. This development has as a primary objective to promote and increase the economic redevelopment on the east region of Puerto Rico. By recovering the infrastructures in a way that will be reliable, updated, strengthened, resilient and cost efficient of the former Naval Station, a new economic redevelopment can be performed in order to generate new incomes as well as new job opportunities.

The redevelopment of the facilities must consider the already established future developments in the Infrastructure Master Plan since several studies, design, as well as agencies efforts have been already performed. Some of the project included in this master plan is the development of a Marine Business Research and Innovation Center. This center will promote the renovation to the existing abandoned and inoperative Coast Guard Pier Area incorporating a new structure building and rehabilitated or replace the existing utilities, embraces the Ocean and the Blue Economy highlighting the ethic of sustainability, conservation, and restoration. The creation of a Field Station Marine Laboratory and Business Innovation is a fundamental asset for this initiative at regional level and will serve the Caribbean as well as internationally Creating the opportunity to incubate transformational next-generation businesses that can provide PR access to economic opportunities, diversifying Puerto Rico's economy and position the Caribbean islands (PR and USVI) as an international Blue Economy knowledge hub.
This Center focuses on the Island's natural assets, creating new businesses, and developing PR's capabilities to insert its industrial base in eco-responsible practices and rapidly growing international market. The proposed Center will provide state-of-the-art infrastructure, knowledge base networking opportunities through on-site researchers, international collaboration and exchange environment to foster innovation, and provide economic development policy direction. The overall operation of the center will provide work opportunities for 38 researchers.

As part of the former Coast Guard Pier area re-development, a project involving two components are currently being assessed and in discussion for design and construction. The project consists in, *The construction of a new Marine Business Research & Innovation Center*

and the rehabilitation of the former Coast Guard Pier. The general description of each component of the project is presented as the following:

- **Construction of a new Marine Business Research, Innovation & Science Caribbean Center**

  The development of the new M-BRIC will consist in the demolition of the former Coast Guard and US Customs Buildings and the construction of a new structure with offices, shared tenants uses and amenities, Conference/classroom space, industrial kitchens labs, restrooms, laboratory, and observatory areas.

- **Rehabilitation of the former Coast Guard Pier**

  The existing Coast Guard Pier is proposed to be rehabilitated and converted into a dock area for the use of the new Marine Business Research, Innovation & Science Caribbean Center. Incorporating the existing mangrove forest into the design of the building, creating a portal that frames views of the harbor and welcomes the public through to the water's edge.

b) Marine Business Research & Innovation Center

i) General Description

This project component consists in developing a new Marine Business Research & Innovation Center. The existing site have two deteriorated buildings to be demolished (Coast Guard and US Customs Buildings). The project scope included the construction of a new structure with offices, shared tenants uses and amenities, Conference/classroom spaces, industrial kitchens labs, restrooms, laboratory and observatory areas, the rehabilitation and improvements of water, wastewater, and electrical utilities. Several new utilities structures will be constructed such as manholes, lift stations and lighting poles among other. In the same way, the surrounding site will be improved in order to reduce the risk of erosion and damages caused by tidal waves and storm tides. Signs of erosion due to possible storm tides was observed in some segments of the site's perimeter.

The preliminary building uses will be for Marine Business Research offices, laboratories and observatories. The following figures shows the preliminary front and back view of the proposed M-BRIC building.

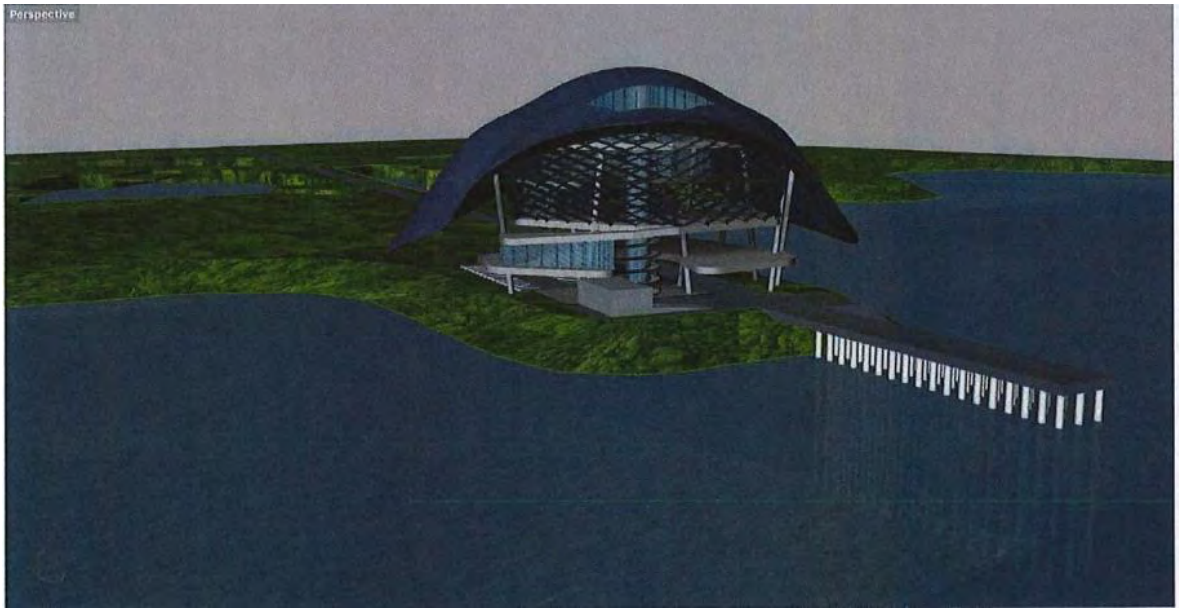


Figure 44 Proposed M-BRIC Building front view

Figure 45 Proposed M-BRIC Building back view

ii) **M-BRIC Development**

The Marine Business Research & Innovation Center goal is to create a balanced mix of tenants that will all benefit from the close cross-sector collaborations. This project can be able the access for Education, Public Awareness, and Community integration. The principal categories for the M-BRIC are promote the studies in the area of Ocean Engineering including groups interested in the development of ocean-related technologies such as ocean

energy, remotely operated vehicles (ROVs) and other submersibles, and remote sensing. Enhance Technology Driven Fisheries Management, which includes Fishing Aggregating Devices (FAD), Offshore finfish culture, Marine field station Hub, Academia, and government agency groups involved in ocean resource observation and related activities and expand Ocean Product Development, which involves groups interested in finding new applications for ocean debris, ocean-harvested products, and the by-products of fishing and/or research.

The project component of the M-BRIC development consists in demolishing the Coast Guard and US Customs Buildings, rehabilitating the existing utilities, improving the site conditions, and constructing a new Marine Business Research & Innovation Center.

iii) M-BRIC Program Areas

The construction of the new Marine Business Research & Innovation Center consists in different amenities that can create business acceleration and economic growth to the region. This new building consists of a 4 stories structure with approximately 42,866 square feet of occupied spaces divided in the following areas:

Qty	Required Area	Required SF	Total SF
	Office Space		
10	Administrative Offices	150	1,500
1	Secure Server Room	80	80
1	Storage /Copier Space.	80	80
2	Maintenance and Cleaning Room	100	200
2	Service Dock/Staging	80	160
10	New Business Offices	150	1500
Subtotal			3,520

Qty	Required Area	Required SF	Total SF
	Shared Space		
1	Lobby	800	800
1	Visitor Center	1,500	1,500
2	Conference Rooms for 100 people	800	1,600
1	Auditorium for 200 people provide Stage and Podium Area.	2,000	2,000
4	Conference Rooms for 12 seats	144	576
1	Open Space/Co-Working Space	800	800
1	Computer and Communication Space	900	900
1	Storage and Janitor Room	100	100
Subtotal			**8,276**

Qty	Required Area	Required SF	Total SF
	Outdoors		
1	Exterior Working Area 20 height	800	800
1	Secure Material Storage	400	400
1	Crane		
1	Wet and Dry Dock for Vessels		
1	Loading and Unloading Ramp		
1	Storage and Janitor Room	100	100
Subtotal			**1,300**

Qty	Required Area	Required SF	Total SF
	Laboratories		
12	Wet Laboratories	200	2,400
16	Dry Laboratories	230	3,680
6	Exterior above water Tanks	2,040	12,240
2	Kitchen fully equipped for produ	400	800
1	Biohazard and Chemical Waste M	100	100
1	Storage and Janitor Room	100	100
Subtotal			**19,320**

Qty	Required Area	Required SF	Total SF
	Cafeteria		
1	Observatory Area	800	800
1	Kitchen Fully Equipped to cook	400	400
1	Lounge -Eating and Sitting Area	600	600
1	Waste Management Systems (Solids and Water).	100	100
1	Storage and Janitor Room	100	100
Subtotal			**2,000**

Qty	Required Area	Required SF	Total SF
	Work Shops		
1	Machine Shop/Fab Lab	800	800
1	Secure Storage Space	400	400
1	Electronic Shop/ Makerspace Lab	600	600
1	Secure Storage Space	400	400
1	Procedures Shop with Extraction Hood	200	200
1	Secure Storage Space	150	150
1	Storage and Janitor Room	100	100
Subtotal			**2,650**

Qty	Required Area	Required SF	Total SF
	Living Studios		
12	Units with 1 bedroom-1 bathroom, Closet and Balcony	475	5,700
1	Storage and Janitor Room	100	100
Subtotal			**5,800**
M-BRIC Building Total Square Foot Area			***42,866***

Qty	Required Area
	Parking and Service Area
35	Parking Spaces
1	Security Control
1	Loading and Unloading Area
1	Waste/Garbage Area

Table 1 M-BRIC Program Areas

The new asphalted parking lot will have an approximate 35 parking lots with security control, loading and unloading area and waste/garbage area. As for the site, several improvements are contemplated to be performed such as a new asphalted parking area and the installation of new rock breakwaters (erosion control) in the perimeter of the site. This control with reduce the risk of erosion damages in the event of tidal waves or storm tides.

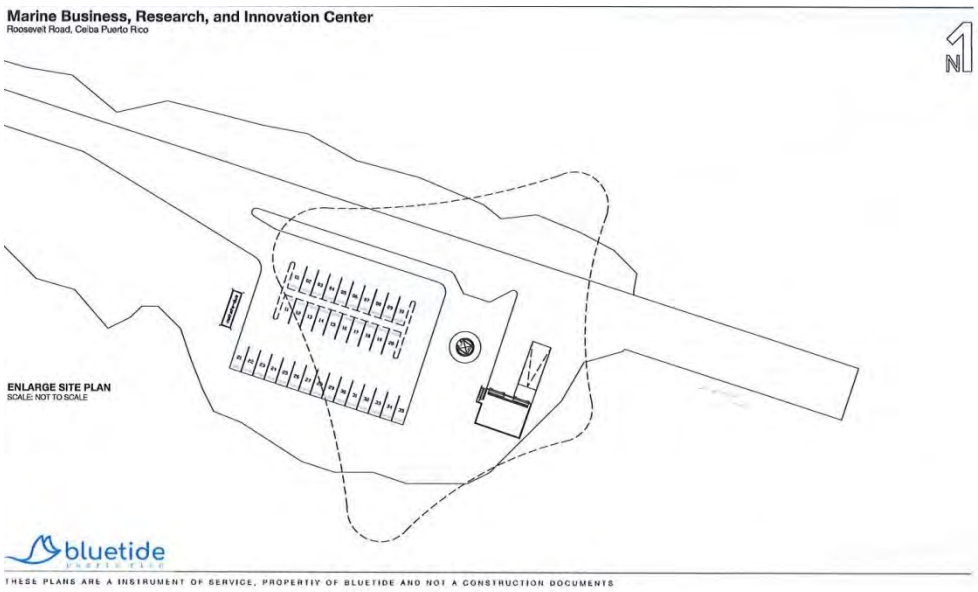


Figure 46 M-BRIC Propose Parking Lot

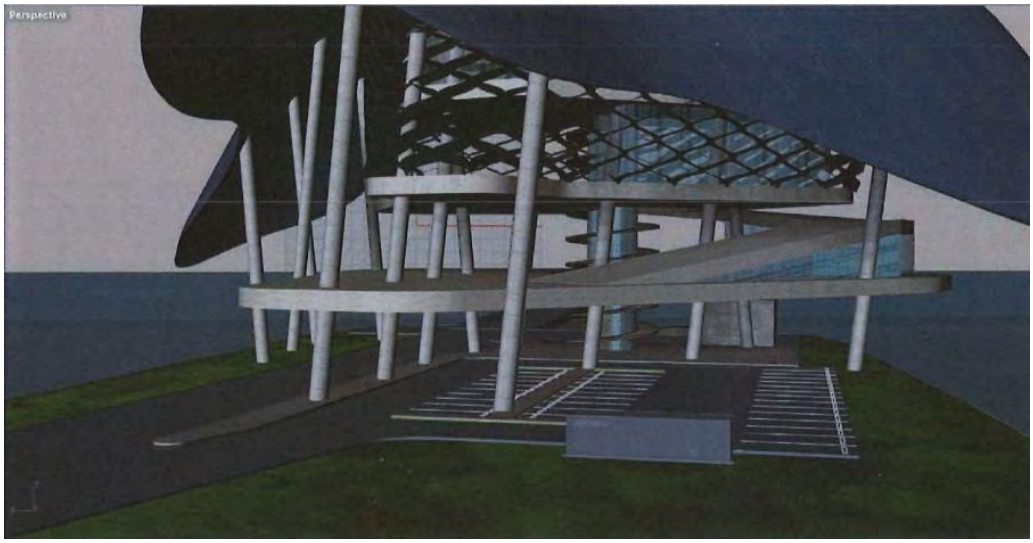


Figure 47: M-BRIC Propose Parking Lot

iv) **Utilities Infrastructure**

a.)Potable Water Utilities

The water service will be provided through an existing 8" diameter PVC water pipe that is located along the access road of the facility. Although the existing water distribution must be properly addressed due to the limitation of information and inability of determine the exact path of underground utilities, based on the obtained information the 8" diameter PVC pipe is currently connected to a series of valves backflow preventer valves before providing service to the former buildings and pier. These valves and distribution pipes (after valve connection) are contemplated to be replaced.

The proposed M-BRIC Building will have a total potable water demand of 3,368 GPD (gallon per day).

Projected Use	Location	Employee/Person	Water Use Rate per Day		Water Demand (GPD)
Apartment (Living) (Hotel)	Level 4	12	50	gpd per person	600
Cafeteria (Restaurant)	Level 3	12	9	gpd per person	108
Office Space (Conference Rooms for 100 people)	Level 2	100	15	gpd per person	1,500
Office Space (Conference Rooms for 12 people)	Level 2	12	15	gpd per person	180
Office Space (Auditorium for 200 people)	Level 2	200	3	gpd per person	600
School (Laboratories for 38 researchers)	Level 1	38	10	gpd per person	380
TOTAL DEMAND Water use rates were obtained from the recommendations in the Wastewater Engineering by Metcalf & Eddy, Third Edition.					**3,368**

Table 2 - Potable Water Demands

Figure 48 Existing Utilities- Potable Water

b.) Sanitary Sewer Utilities

The wastewater service for the new M-BRIC will be temporary provided by collecting the wastewater in a new sanitary manhole. The manhole will therefore discharge through gravity to a new lift station in order to finally discharge the wastewater to the existing gravity distribution system. There is an existing manhole type-lift station which has two turbine vertical pumps and is not in operational conditions.

A new lift station is required in order to provide a reliable and appropriate wastewater service. Since the existing lift station wastewater distribution force line has not been properly addressed due to the limitation of information and inability of determine the exact conditions and path this underground line, a new 4" diameter PVC pipe preliminary determined to be installed from the new lift station along Kearsage Road to an existing manhole MH No. 315) on Langley Drive with a longitude of approximately 1,150 meters. The proposed M-BRIC Building will have a total wastewater discharge of 3,010 GPD gallon per day.

Projected Use	Location	Employee/Person	Water Use Rate per Day		Water Demand (GPD)
Apartment (Boarding House)	Level 4	12	40	gpd per person	480
Cafeteria (Restaurant)	Level 3	12	3	gpd per person	36
Office Space (Conference Rooms for 100 people)	Level 2	100	3	gpd per person	300
Office Space (Conference Rooms for 12 people)	Level 2	12	3	gpd per person	36
Office Space (Auditorium for 200 people)	Level 2	200	3	gpd per person	600
School with Cafeteria (Laboratories for 38 researchers)	Level 1	38	15	gpd per person	570
TOTAL DISCHARGE Water use rates were obtained from the recommendations in the Wastewater Engineering by Metcalf & Eddy, Third Edition.					**2,022**

Table 3 - Wastewater Discharges

Figure 49 Existing Utilities- Sanitary System

c.) Storm Sewer Utilities

There is no existing sewer system in the area all the surface runoff discharges directly in the Ensenada Honda Bay. For the New M-BRIC Building is necessary the construction of a new storm sewer system. The purpose of the storm sewer system is to help prevent flooding by diverting rainwater off the streets and other paved surfaces into a natural water body. The runoff can carry in underground pipes or open ditches and discharges into the nearest water body in the area in this case the Ensenada Honda Bay.

d.) Electric Utilities

The electricity for the former Coast Guard and US Customs building was supplied by a primary 13.2 KV line. Currently, although most of the wood poles were observed in standing position, a portion were slightly bended (standing in a diagonally position). The primary line was also observed detached from a portion of the poles located in Kearsage road. For the development of the new M-BRIC the existing wood poles will be replaced with new concrete or steel electric poles in order to ensure electrical power resiliency. Also, as part of the wood poles replacement, the cross-country section located from Langley Drive to Kearsage Road will be deviated following the path of the Kearsage Road until connecting with the existing Langley Drive electrical distribution. This replacement considers installing also a new primary 13.2 KV line. Since many of the electrical components were observed severely damaged in both buildings (Coast Guard and US Customs Buildings), all electrical components considered to be replaced for the development of the new M-BRIC. The electrical works includes the installation of a new pad mounted substation, main switchboard, led lighting poles, primary and secondary feeders, interior electrical components (lighting fixtures, conduits, among others) and a new Emergency generator.
The proposed M-BRIC Building will have a total electrical demand of approximately of 325 kVA.

Projected Use	Location	Apartments	Development Area (Gross Square Feet)	Load Rate	Load Demand kVA 13.2kV
Apartments (Living)	Level 4	12		4kVA/ apt	48.00
Offices Space + Cafeteria	Level 3		4,520.00	0.0138KVA/sq. ft.	62.38
Offices Space (Shared Space)	Level 2		8,276.00	0.0138KVA/sq. ft.	114.21
School (Laboratories)	Level 1		7,080.00	0.0138KVA/sq. ft.	97.70
TOTAL LOAD DEMAND kVA 13.2 kV					**322.29**

Table 4 Electric Demands

Figure 50 Existing Utilities- Electrical

e.) Telecommunication Utilities

There are no existing telecommunication utilities in the area. For the New M-BRIC Building is necessary the installation of new telecommunication utilities. The installation of these utilities can be aerial via the existing electric poles or underground and the connection could be made through the existing telecom optic fiber line located at approximate 1.0 km at Langley Drive.

v) Access Road

The project site area is located at the end of Kearsarge Road. This road has 5.5 meters of width and approximate 1,054 meters long and connect directly with the Langley Drive. For the new M-BRIC Building some modifications are proposed for the Kearsarge Road. One of these modifications is the expansion of the entry area located at the front of the new proposed M-BRIC Building. This expansion can provide a better traffic flow circulation for the building tenants and researchers. In addition, other improvements are needed on Kearsarge Road due the damages suffered under Hurricanes Irma and Maria in 2017. Asphalt base repairs, repavement, new traffic marking, new signing and road lighting are needed.

Figure 51 Existing Access Road

Figure 52 Existing Access Road

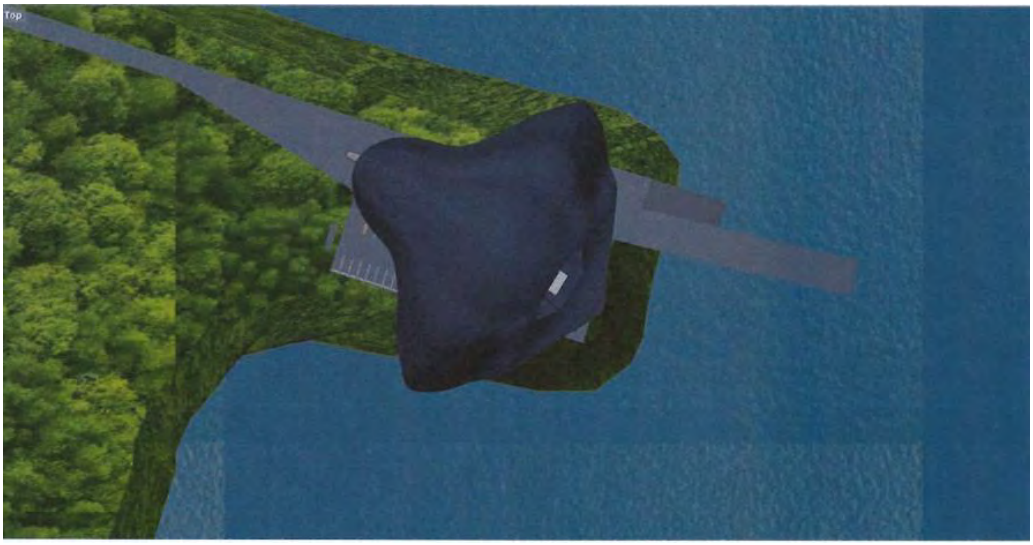


Figure 53 New M-BRIC Building Road Modifications

vi) **Flood Levels**

The proposed building structure have an open space in the ground elevation area, in case natural events happen like extreme floods no significant damages to the structure are expecting. The FEMA flood maps presented an elevation of 5.20 ft the proposed finish floor elevation must be greater than this elevation to no present any potential flood effect for the reconstruction and development of the new Marine Business Research, Innovation & Science Caribbean Center.

Figure 54 Proposed M-BRIC Building Structure

vii) **Sustainability**

The design for the Marine Business & Innovation Center propose to include different eco-friendly alternatives can turning the building in an auto-substantiable structure. Some of the alternatives are the benefit of the natural power solar energy can be a low effective cost alternative and an eco-friendly benefit for the structure, the rainwater and water reuse system alternative can help relieve the strain on the local municipal water supply, are different commercial rooftop collection systems available, but simply diverting the downspout into a covered barrel is an easy, low-cost approach.

A biodigester for gas collection can be a potential eco-friendly alternative. The principal apportion for the biodigester is the conversion of organic matter to biogas this conversion has many potentially beneficial environmental and management side effects. It is fed with organic material, which is broken down (decomposed) by micro-organisms (bacteria) is an oxygen-free (anaerobic) environment to produce a renewable energy called biogas (methane and carbon dioxide) and other material that is mainly used as fertilizer.

These and other proposed alternatives can be a great potential eco-friendly infrastructure element that can be provide beneficial developments to the community and the environment.

viii) Potential Construction Problems

The project involves some construction tasks, which may arise some difficult situations during the construction phase. The following are the expected situations:

- Since the project is located inside a flood zone area, it is possible that regulatory agencies estipulate requirements that affects the projected building preliminary design.
- Due to the location of the project (near wetlands and maritime zone) special permits such as US Army Corps of Engineers nationwide permit is expected to be required in order to perform the project.
- Although since the construction date of the existing buildings is practically recent (1987), the presence of Lead-based paint and asbestos containing material may be low, this situation can't be discarded unless multiple tests to determine the presence of these substances are performed. This situation can affect economically and time completion of the demolition of the project.
- Due to the location near the seashore, ground water table can be encountered in the construction of the new lift station and the installation of the new force line during excavation operations. Dewatering procedures shall be contemplated in order to provide a safe and dry work area.
- Possible location of underground utilities such as water, storm sewer and telecommunications fiber optic lines along the roads, which shall be completely identified during the design and construction phases, in order to minimize or avoid any conflicts or services interruptions.
- The location of solid waste management units or environmentally sensitive areas in the project site. Construction protection measures shall be included in order to not disturb those sensitive areas or take appropriate and approved measures. Also, the location of any temporary storage of equipment or materials near those areas shall be avoid.
- A potential construction problem that shall be taken into consideration is the location of the area designated habitat for the Yellow Shouldered Blackbird. Construction protection measures shall be included in order to not disturb these sensitive areas and

to avoid the location of any temporary storage of equipment or materials near those areas.

- The necessity of installation of erosion and sedimentation control in the project.

ix) Environmental Impacts

The project components are considered to not have significant environmental impacts since most of the areas to be impacted have been already developed, although certain precaution must be taken into consideration to not affect the existing environmental conditions. Two environmental aspect precaution must be taken into consideration; if the areas located inside the designated areas of Breeding Habitat of Yellow Shouldered Blackbird also known as the ''Mariquita de Puerto Rico'' or ''Capitán'' and the areas where SWMU's 1 and AOC D are located.

The proposed improvements will be located outside and distant of designated natural zones where endangered species can be found. Even though the area is not a designated natural zone of endangered species, if endangered species such as Yellow-shouldered Blackbird nesting areas are found, construction activities shall be performed with restrictions in order to prevent, the intrusion of heavy equipment and personnel into those sensitive areas. No effect on threatened or endangered wildlife is expected due to the proposed improvements.

x) Social and Community Impacts

This project provides multiple positive social benefits to the community re-development by increasing the economic development. The overall operation of the center will provide work opportunities for 38 researchers. Its highly central location on the waterfront would draw a significant percentage of visitors to Roosevelt Roads and the MBRIC and such a staffing function would enable cross-marketing of other attractions around. The proposed design is encouraged to be an exceptional cutting-edge innovation landmark and advancement for Roosevelt Roads Community.

xi) Permits

In Puerto Rico permit procedures are carried out through the Office of Permit Management (OGPe) and its electronic portal Single Business Portal (SBP). To begin the process a project profile must be created where you must present among other things brief description of the proposed action, cadastral number, location, evidence of ownership, letters of authorization of the owner of the project and owner of the property.

The first step to permit procedures is to present an environmental document indicating the impact of the proposed action on the site to be developed and its surroundings. This in compliance with the Law on Environmental Public Policy (Act 416 of September 22, 2004). This could be achieved through an Environmental Recommendation (REA) followed by an Environmental Assessment Determination (DEA) which will include Flora and Fauna studies, Environmental sensitivity areas identification, infrastructures recommendation from agencies for new water intakes and water discharge and control measures to avoid environmental impact to the site and surroundings.

The proposed action for the construction of the Marine Business Research and Innovation Center will include minimal land disturbance but will not produce any flora and fauna alteration because the project site location is at existing site already develop in poor conditions and the construction will prepare the spaces to converted in adequate building. All the activities related are going to be regulated and safely manages to achieve environmental compliance for example sediment and erosion control and any other require by the agencies.

Due to the nature of the project, on which most of it will be performed on a developed area no major issues regarding the permits or endorsements needed for the project are expected. There are only two major endorsements that can affect the overall project schedule, modify the project scope since it involves more complex and time-consuming processes; one is the US Fish and Wildlife Service, due to the location near the seashore and environmentally sensitive areas, and the location inside a flood zone area.

The following permits or endorsements shall be considered:

- OGPE (Oficina de Gerencia de Permisos):
  - Environmental Evaluation
  - Infrastructure Recommendation Requests (SRI)
  - Consolidated General Permit (Permiso Único Incidental)
  - Earth Movement Incidental Permit
  - Construction Permit
  - Use Permit
- Comisión de Servicio Público (CSP)
  - Excavation Notification (during the construction phase)
- Municipality of Ceiba: endorsement

- Autoridad de Desperdicios Sólidos (ADS)
  - Waste Recycling Program: (during the construction phase)
- State Historic Preservation Office (SHPO): endorsement
- PR Institute of Culture: endorsement
- US Fish and Wildlife Service: endorsement
- US Corps of Engineers Joint Permit

c) Cost Estimate

The cost estimate for this project were obtained by the Specific Award Conditions Marine Center document provided by Bluetide Puerto Rico. For the Budget Analysis obtained by the Bluetide Puerto Rico Organization Business Plan presentation please refer to Appendix D.

The estimated project cost is of **$16,000,000.** The following table describes in detail the estimated cost of each component of the project:

Cost Classification	Proposed	Approved
Administrative and Legal Expenses	$ 160,000	$ 160,000
Land, Structures, Right-of-Way, Appraisals, Etc.	$ 0	$ 0
Relocation Expenses and Payments	$ 0	$ 0
Architectural and Engineering Fees	$ 765,325	$ 765,325
Other Architectural and Engineering Fees	$ 64,000	$ 64,000
Project Inspection Fees	$ 137,070	$ 137,070
Site Work	$ 744,000	$ 744,000
Demolition and Removal	$ 536,000	$ 536,000
Construction	$ 9,344,000	$ 9,344,000
Equipment	$ 1,300,000	$ 1,300,000
Miscellaneous	$ 540,000	$ 540,000
Contingencies	$ 2,409,605	$ 2,409,605
TOTAL PROJECT COSTS	**$ 16,000,000**	**$ 16,000,000**

Table 5 Cost Estimate for the New Marine Business & Innovation Center

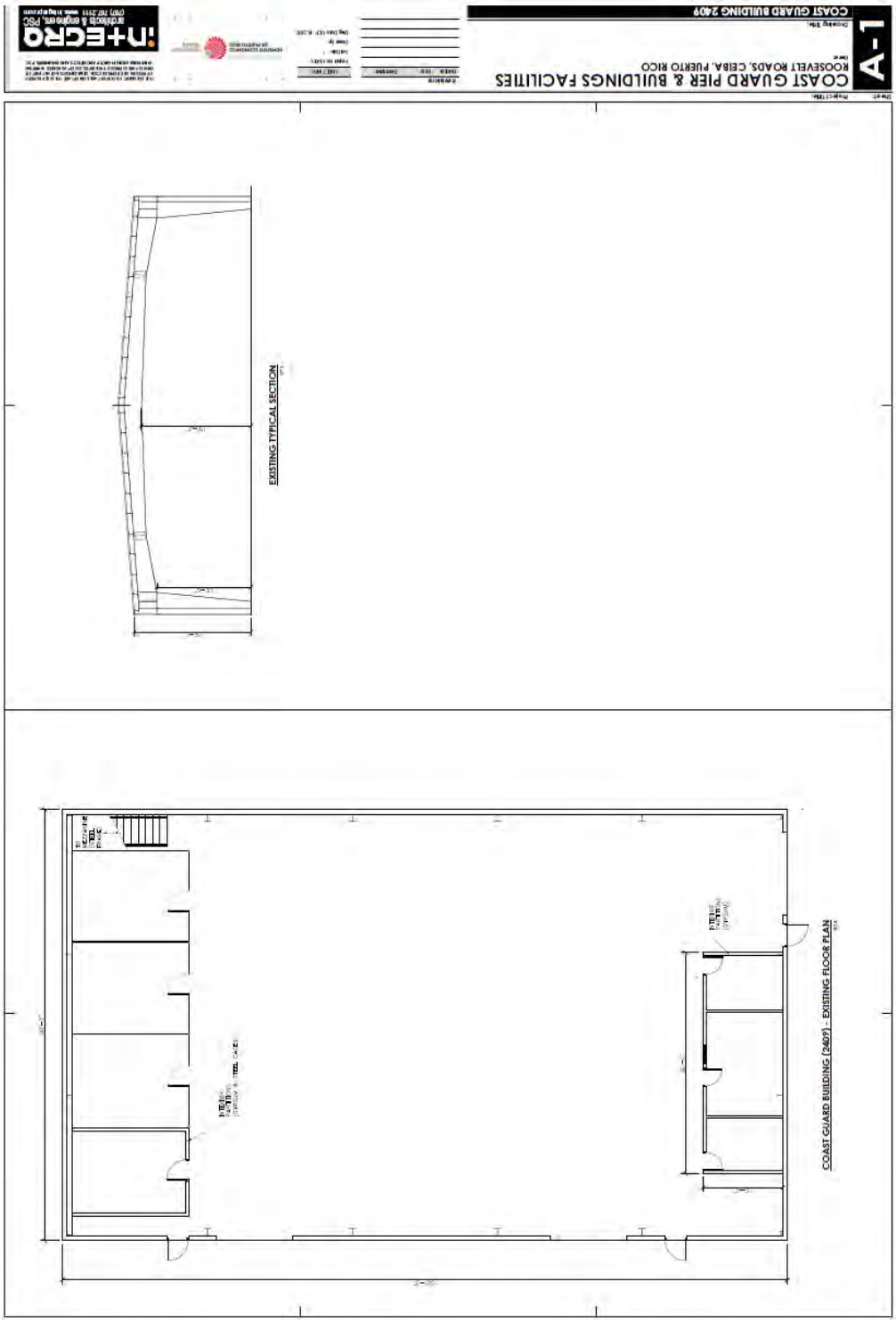
The total approved authorized budget is:

Federal Share (EDA Amount)	$12,800.00
Non-Federal Matching Share	$ 3,200,000
Total Project Cost	**$16,000,000**

Table 6 Total Project Cost Share

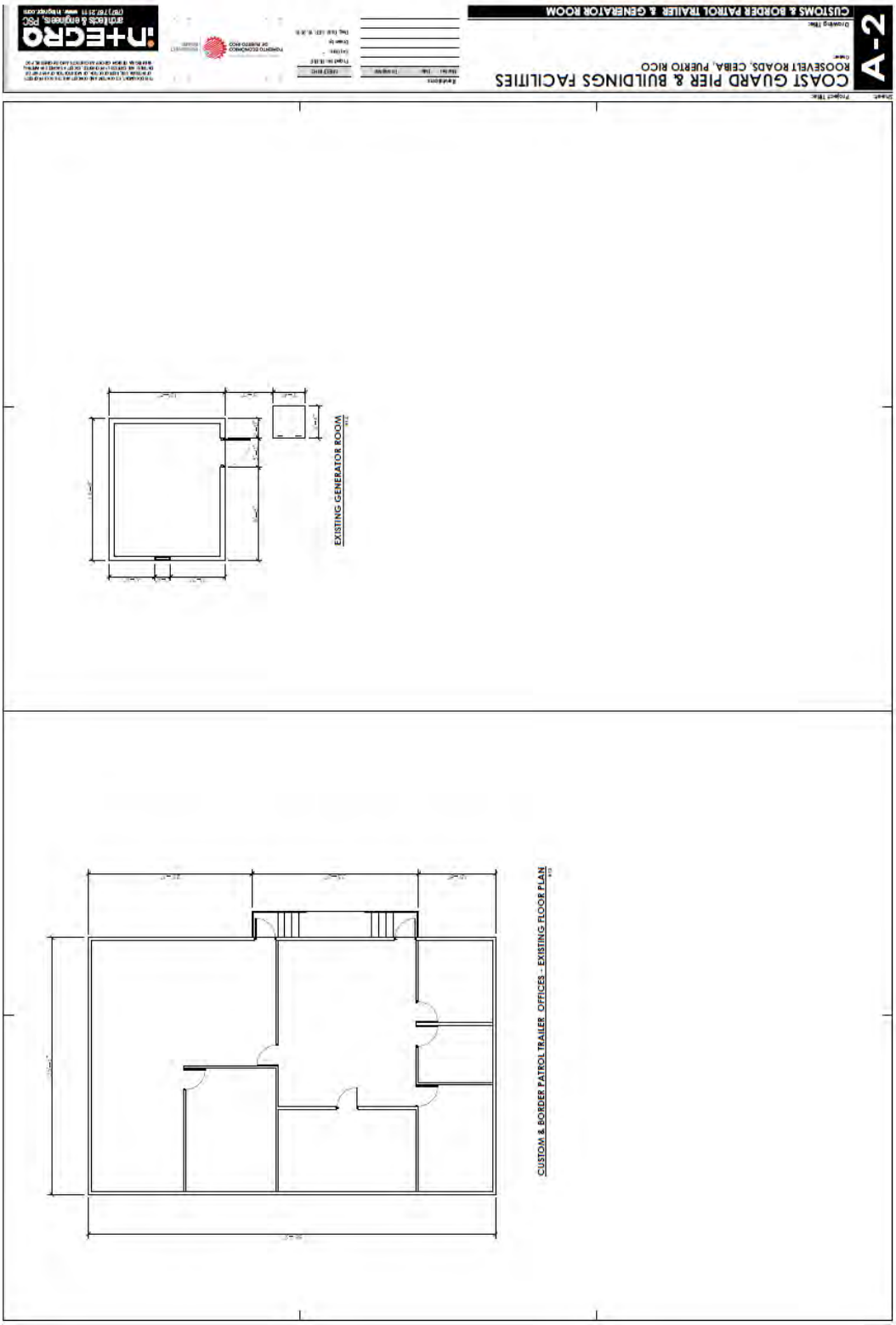
8) APPENDIXES

a.) Existing Coast Guard Building 2409 As- Built Plan & Elevation



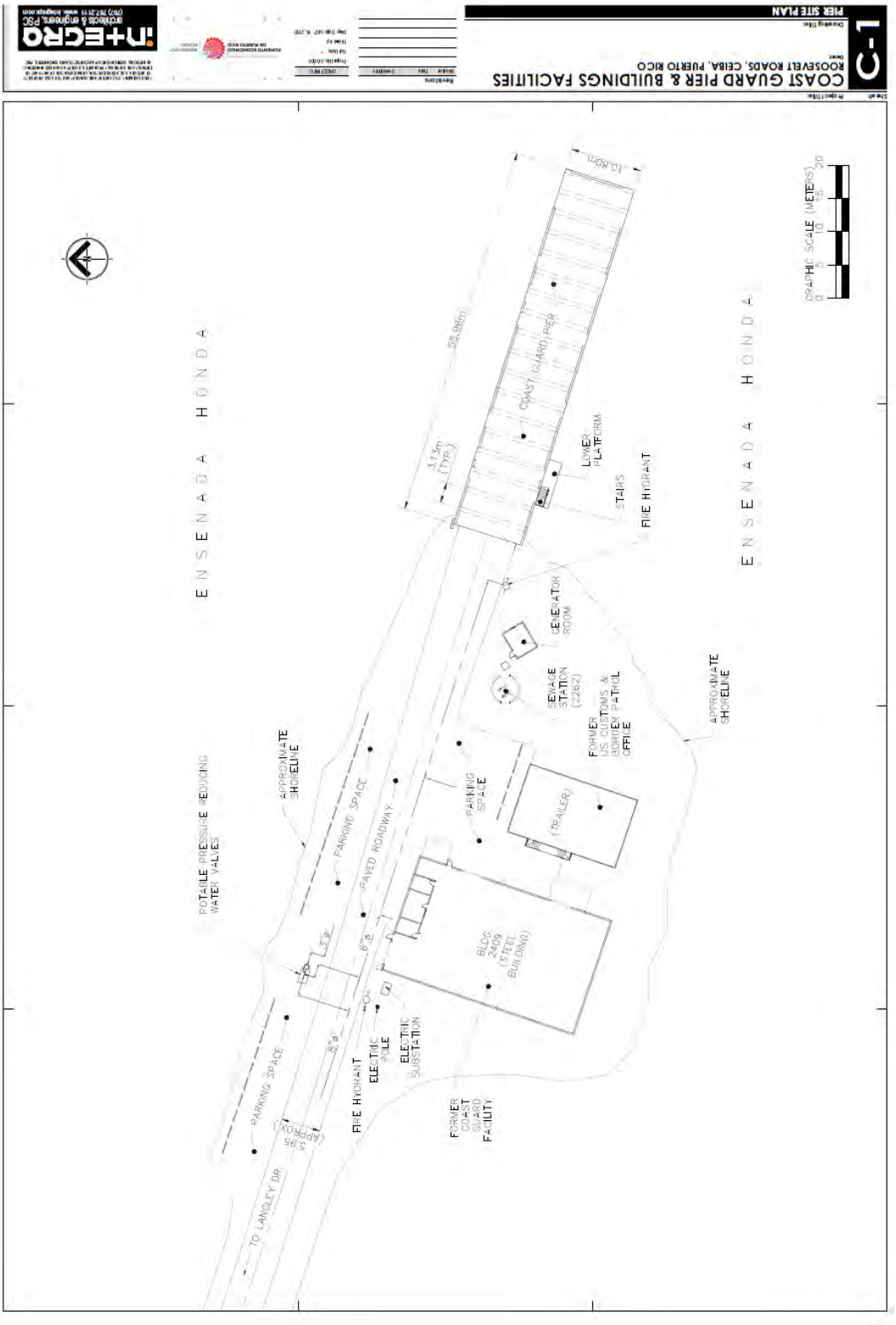
Appendix A: Existing Coast Guard Building 2409 As- Built Plan & Elevation

b.) Existing US Customs Trailer & Lift Station 2262 As- Built Plans



Appendix B: Existing US Customs Trailer & Lift Station 2262 As- Built Plans

c.) Existing Coast Guard Pier Site Plan



Appendix C: Existing coast Guard Pier Site Plan

d.) Marine Business and Innovation Center Budget Analysis

A	Substructure	10.08%	$19.36	$871,299.82
A1010	Foundations		$6.65	$299,437.72
A1030	Slab on Grade		$4.42	$198,995.22
A2010	Additional Structural Work		$9.37	$421,866.87
B	Shell	26.75%	$51.38	$2,312,211.35
B1010	Floor Construction		$4.26	$191,867.05
B1020	Roof Construction		$19.33	$870,017.86
B2010	Exterior Walls		$13.50	$607,555.67
B2020	Exterior Windows		$7.83	$352,361.92
B2030	Exterior Doors		$4.33	$194,877.56
B3010	Roof Coverings		$1.79	$80,517.20
B3020	Roof Openings		$0.33	$15,014.10
C	Interiors	10.70%	$20.56	$925,282.67
C1010	Partitions		$6.44	$289,893.46
C1020	Interior Doors		$2.00	$89,872.13
C1030	Fittings		$0.06	$2,555.01
C3010	Wall Finishes		$2.72	$122,603.74
C3020	Floor Finishes		$4.97	$223,747.60
C3030	Ceiling Finishes		$4.37	$196,610.73
D	Services	21.68%	$41.65	$1,874,278.18
D2010	Plumbing Fixtures		$16.62	$747,798.20
D2020	Domestic Water Distribution		$0.85	$38,279.78
D2040	Rain Water Drainage		$0.48	$21,647.27
D3040	Distribution Systems		$0.67	$30,081.43
D3050	Terminal & Package Units		$10.45	$470,272.61
D4010	Sprinklers		$1.15	$51,732.19
D4020	Standpipes		$0.19	$8,592.78
D5010	Electrical Service/Distribution		$0.81	$36,484.50
D5020	Lighting and Branch Wiring		$9.27	$417,326.45
D5030	Communications and Security		$0.63	$28,509.08
E	Mechanical Equipment	0.10%	$19.53	$878,906.87
E1020	Institutional Equipment		$1.03	$46,520.65
E1090	Elevator Equipment		$5.09	$228,966.22
F	Demolitoin and Removal	0.04%	$8.22	$369,840.00
	Equipment (surveillance and audi. Equip., lifts, cafeteria appliances, infrimary equip., lockers, etc)	0.10%	$19.93	$897,000.00
F	Special Construction - Solar Panel System	0.04%	$8.28	$372,600.00
G	Building Sitework	0.06%	$11.41	$513,360.00
SubTotal		100%	$192.11	$8,644,938.88
General Conditions and Management		8.00%	$22.16	$997,191.12
Contractor Fees (Overhead, Profit)		15.00%	$41.55	$1,869,600.00
Municipal Taxes (without EQUIPMENT; Equipment does not pay Municipal Taxes)		5.00%		$578,350.00
Municipal Patent		0.50%		$62,320.00
Payment and Performance Bond		1.25%		$155,800.00
Builders Risk		0.25%		$31,160.00
General Liabiltiy Insurance		1.00%		$124,640.00
Other Administrative Cost				
Administrative and Legal Expenses		1.00%		$160,000.00
Architectural and Engineering Fees		4.78%		$765,325.00
Other A&E Fees		0.40%		$64,000.00
Inspection Fees		0.86%		$137,070.11
Other		0.45%		$71,333.79
				$0.00
UNFROSEEN		14.61%		$2,338,271.10
				$0.00

Appendix D: Marine Business and Innovation Center Budget Analysis

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