



PUBLIC NOTICE

US Army Corps of Engineers, Honolulu District

Regulatory Office (CEPOH-RO)
Building 230
Fort Shafter, Hawaii 96858-5440

Public Notice Date: November 21, 2016
Expiration Date: December 22, 2016
Permit File Number: POH-2015-00172

FEDERAL PUBLIC NOTICE

Interested parties are hereby notified that an application has been received for a Department of the Army permit for certain work in waters of the United States as described below and shown on the attached drawings and plans.

APPLICANTS:

Mr. John S. Williams
NEC America, Inc.
6535 N. State Hwy 161
Irving, TX 75039

Mr. Andrew M. Gayle
GTA (Teleguam Holdings LLC)
624 N. Marine Corps Drive
Tamuning, GU 96913

WATERWAY AND LOCATION OF THE PROPOSED WORK:

The proposed project would be located Project corridor would be located within tidal waters of Piti Bay and Tepungan Channel, Philippine Sea, Pacific Ocean located off Pedro Santos Memorial Park in Piti, Guam. Center Coordinates: Latitude 13.46555 and Latitude 144.69316.

PROPOSED PROJECT AND PURPOSE:

NEC America Inc. and GTA (Teleguam Holdings LLC) propose to install six (6) new conduits to receive submarine fiber optic cables, and shortly after, land two new submarine cables in two of the conduits for the Southeast Asia-U.S. (SEA-US) telecommunication system linking Asia with Guam, Hawaii and California. The project is needed to complete the Guam link of the SEA-US system with Asia and the rest of the U.S. The four spare conduits are needed to accommodate future cable landings anticipated by GTA. Project locations and details are depicted on the enclosed project plans (Enclosure 1).

The project would dredge/excavate a trench (3-feet deep by 6-feet wide by 405-feet long) on the reef flat, from mean high water (MHW) to the shoreward edge of the Tepungan Channel within a 36-foot-wide construction corridor. Six 4.8-inch (outer) diameter ductile iron conduits would be installed in the trench. The trench would be backfilled with washed coarse aggregate stones and the excavated native reef material. A concrete bulkhead (6-

feet wide by 3-feet high by 10-feet long) would be installed via tremmie concrete methods at the conduit terminus to keep the conduits in place. An additional 155-foot long trench would be excavated from MHW to a new upland beach manhole in Pedro G. Santos Memorial Park. Shortly after, two fiber-optic marine cables, servicing Hawaii and the Philippines, would be landed through two of the conduits and pulled to shore where they would be spliced to land cables in the new beach manhole located above the high tide line. Articulated (split) pipe (6-inch diameter) would be placed over the cables from the proposed bulkhead to depths of -200 meter (656 feet) MLW. The cables would be selectively pinned, at approximately 20 locations, to the seabed with wing clamps at locations where no live corals are present. The submarine cable would be laid in a path to maximize use of sand bottom and to minimize impacts to hardbottom substrate. All live corals that can be relocated would be transplanted prior to the commencement of any work per the enclosed coral transplantation plan (Enclosure 2). Any other marine organisms within the construction corridor would be removed and relocated away from the construction activities. The proposed work is anticipated to take approximately 60 days to complete. Best management practices are detailed in the enclosed Environmental Protection Plan (EPP) (Enclosure 3)

Both temporary and permanent impacts to coral reef (hardbottom substrate) are anticipated with the proposed activities. The impacts are summarized as follows and detailed in Enclosure 4:

1. Direct but temporary impacts from the cable trench temporary erosion and sediment control measures (i.e. silt curtains, sandbags and rebar supports) is estimated to be 4,770.2 square feet (SF) (0.11-acre). These impacts would be temporary and the natural reestablishment of corals and marine organisms is anticipated.
2. Direct and long-term temporary impacts from the proposed cable trench would result from the excavation of 2,430 SF (0.06-acre) of coral reef flat, removing 223 cubic yards (CY) of reef material. Approximately 82.17 CY of coarse aggregate stone would be placed as bedding material under the conduits and covered with approximately 130.54 CY of the excavated reef material to restore the trench area to pre-construction grades. These impacts would have a long-term effect on aquatic resource functions, however, with the restoration of the site with native coral material and the eventual natural reestablishment of corals and marine organisms no permanent losses are anticipated.
3. Direct and permanent loss of coral reef hardbottom from the construction of the concrete bulkhead are estimated to 60 SF (0.0014-acre). The area would be excavated and filled with approximately 4.17 CY of marine grade concrete. It is anticipated that the concrete would attract coral reestablishment in the area, as corals have been documented to grow on concrete structures.
4. The two cables would have direct impacts to hardbottom and softbottom substrates where the cable are laid on the seafloor for over 66,000 linear feet from mean high water to the 3 nautical miles (nm) limit, which is the limits of Section 10 jurisdiction. The combined footprint of the two cables is estimated to impact 7745 SF (0.18-acre) of hardbottom substrate and 3302 SF (0.08-acre) of softbottom substrate. These impacts would be assessed as permanent impacts, but the natural reestablishment of corals on the articulated pipe and cables is anticipated.

5. Direct but temporary impacts within the 36-foot-wide by 405-foot-wide work corridor are anticipated as a result of the use of temporary elevated wooden platforms that would be placed on the reef flat to house the excavator and the use of a rock truck with rubber tires that would be traversing the reef to load and off-load excavated reef material on uplands. The temporary platforms would have two 6-inch wide by 24-foot-long steel support runners to minimize contact with the reef and would be lifted and leapfrogged as the excavator works its way down the corridor. The rock truck would have rubber tires and would be able to articulate its body to minimize impacts on the reef.

The applicant proposes to offset temporal loss of ecological function associated with the proposed activities by relocating/transplanting non-Leptastrea hard corals within and immediately adjacent to the cable trench corridor. The relocation would be followed by monitoring for survival of the relocated corals for 18-months. In order to offset the permanent placement of submarine cable structures on shallow hardbottom substrate with up to approximately 13% coral reef cover, the applicant is proposing contributions to a coral reef restoration program in the same watershed as the impact site.

AUTHORITY:

A Department of the Army permit is required pursuant to:

- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) - To perform work in or affecting navigable waters of the United States.
- Section 404 of the Clean Water Act (33 U.S.C. 1344) - Discharge dredged or fill material into waters of the United States. The Corps' public interest review would consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 CFR 230).
- Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413) - Transport dredged material for the purpose of dumping it into ocean waters. The Corps' public interest review would consider the criteria established under authority of Section 102(a) of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (40 CFR Parts 220 to 229), as appropriate.

WATER QUALITY CERTIFICATION:

The proposed action would result in a discharge of a pollutant into a water of the U.S. and would require authorization from the Corps in accordance to Section 404 of the Clean Water Act of 1972 (CWA). Under Section 401 of the CWA (Public Law 95-217), the Corps may not issue a permit for the described work until the applicant obtains a certification, or waiver of certification, from the Guam Environmental Protection Agency.

COASTAL ZONE MANAGEMENT ACT CERTIFICATION:

The proposed activity would affect land or water uses in the Coastal Zone. Under Section 307(c)(3) of the Coastal Zone Management Act of 1972, as amended by 16 U.S.C. 1456(c)(3), the Corps may not issue a permit for the described work until the applicant obtains a Federal Consistency Concurrence from the Guam Bureau of Statistics and Plans, Guam Coastal Management Program.

CULTURAL RESOURCES:

Pursuant to Section 106 of the National Historic Preservation Act (NHPA), our assessment of the project leads us to a preliminary determination that known properties eligible for inclusion or included in the National Register of Historic Places are located near, but not within, the permit area. Consultation with the Government of Guam Department of Parks and Recreation, Guam Historic Resources Division State Historic Preservation Office (SHPO) has been completed. On September 12, 2016, the SHPO concurred with the Corps' determination that the proposed undertaking would have no adverse effect on historic properties listed or eligible for listing in the NRHP, as long as adherence to the proposed Archaeological, Monitoring, Identification, Evaluation, and Data Recovery Plan is required as a DA permit condition. Therefore, no further consultations with the SHPO would be conducted in conjunction with this public notice.

ENDANGERED SPECIES:

Pursuant to Section 7 of the Endangered Species Act (ESA), federal agencies must consult with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service (USFWS) on any action that may affect a species listed (or proposed for listing) under the ESA as threatened or endangered or any designated critical habitat.

Based on the project location, the following protected near shore marine species under NMFS jurisdiction have the potential to occur near the project location: Green sea turtle (*Chelonia mydas*), Central West Pacific DPS (endangered), Hawksbill Sea Turtle (*Eretmochelys imbricata*), (endangered), Indo-West Pacific DPS Scalloped Hammerhead shark (*Sphyrna lewini*), (threatened), and threatened coral species (*Acropora globiceps*, *Acropora retusa*, and *Seriatopora aculeata*). No designated critical habitat exist in or adjacent to the project site. The proposed work may result in adverse impacts to listed coral species as they may be present in the project area. Listed sea turtles and sharks which infrequently traverse the project area, would be protected through proactive measures including pre-work visual surveys, monitoring, soft startups and stop work protocols in the event a sea turtle is recorded. The implementation of these BMPs in an area where sea turtles are rarely observed and where preferred nesting habitat is absent, implies that a may affect, not likely to adversely affect determination is appropriate relative to the listed sea turtles and sharks. A separate consultation with NMFS Protected Resources Division would be conducted in conjunction with this public notice.

In October 2015, the U.S. Fish and Wildlife Service (USFWS) listed 23 terrestrial plant and animal species from the Mariana Islands as threatened or endangered species under the Endangered Species Act (ESA). General pedestrian surveys were conducted in September 2015 to assess the presence of terrestrial and avian fauna that may exist within the project sites. None of the listed species were found in the project area. There are no designated critical habitat areas within or adjacent to the project site. Preliminary determinations indicate that the described activity would not affect threatened or endangered terrestrial species. Consultation with USFWS under Section 7 of the Endangered Species Act of 1973 (87 Stat. 844) is not required for the proposed activity.

ESSENTIAL FISH HABITAT:

The proposed work is being evaluated for possible effects to Essential Fish Habitat (EFH) pursuant to The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), which requires all Federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat. The Honolulu District includes areas of EFH as Fishery Management Plans. We have reviewed the January 20, 1999, Western Pacific Fishery Management Council's Environmental Assessment to locate EFH area as identified by NMFS. Preliminary determinations indicate that the described activity would likely have an adverse effect on EFH. Therefore, a separate EFH consultation with NOAA would be conducted, under MSA, for the proposed activity.

FEDERAL EVALUATION OF APPLICATION:

The decision whether to issue a permit would be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision would reflect the national concern for both protection and utilization of important resources. The benefit 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 would be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic 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.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to evaluate the direct, indirect, and cumulative impacts of this proposed activity. Any comments received would be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above.

PUBLIC HEARING:

Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state clearly and concisely, the reasons and rationale for holding a public hearing. The District Commander would then decide if a hearing should be held.

COMMENT AND REVIEW PERIOD:

Comments on this public notice should be made in writing via conventional mail or e-mail. Comments would be accepted and made part of the record and would be considered in

determining whether it would be in the public interest to authorize this proposal.
Conventional mail comments should be sent to:

U.S. Army Corps of Engineers, Honolulu District
Guam Regulatory Field Office, Attn: Katy Damico
Apra Harbor Naval Complex
PSC 455 Box 188
FPO, AP 96540-1088

Alternatively, comments may be emailed to Katy.R.Damico@usace.army.mil . Reference POH-2015-00172 in the subject heading of the email. In order to be accepted, e-mail comments must originate from the author's e-mail account.

Both conventional mail and e-mail comments must include the DA permit number POH-2015-00172, and the commenter's name, address, and phone number. **All comments whether conventional mail or e-mail should be received by the close of business on DECEMBER 22, 2016.**

PRIVACY & CONFIDENTIALITY:

It should be noted that materials submitted as part of the permit application become part of the public record and are thus available to the general public under the procedures of the Freedom of Information Act (FOIA). Submissions should not include any information that the submitter seeks to preserve as confidential.

If you have any questions about this project or the permit process, please contact Ms. Katy Damico in the Guam Regulatory Field Office via telephone at (671) 339-2108 or (808) 835-4160 or via email at Katy.R.Damico@usace.army.mil.

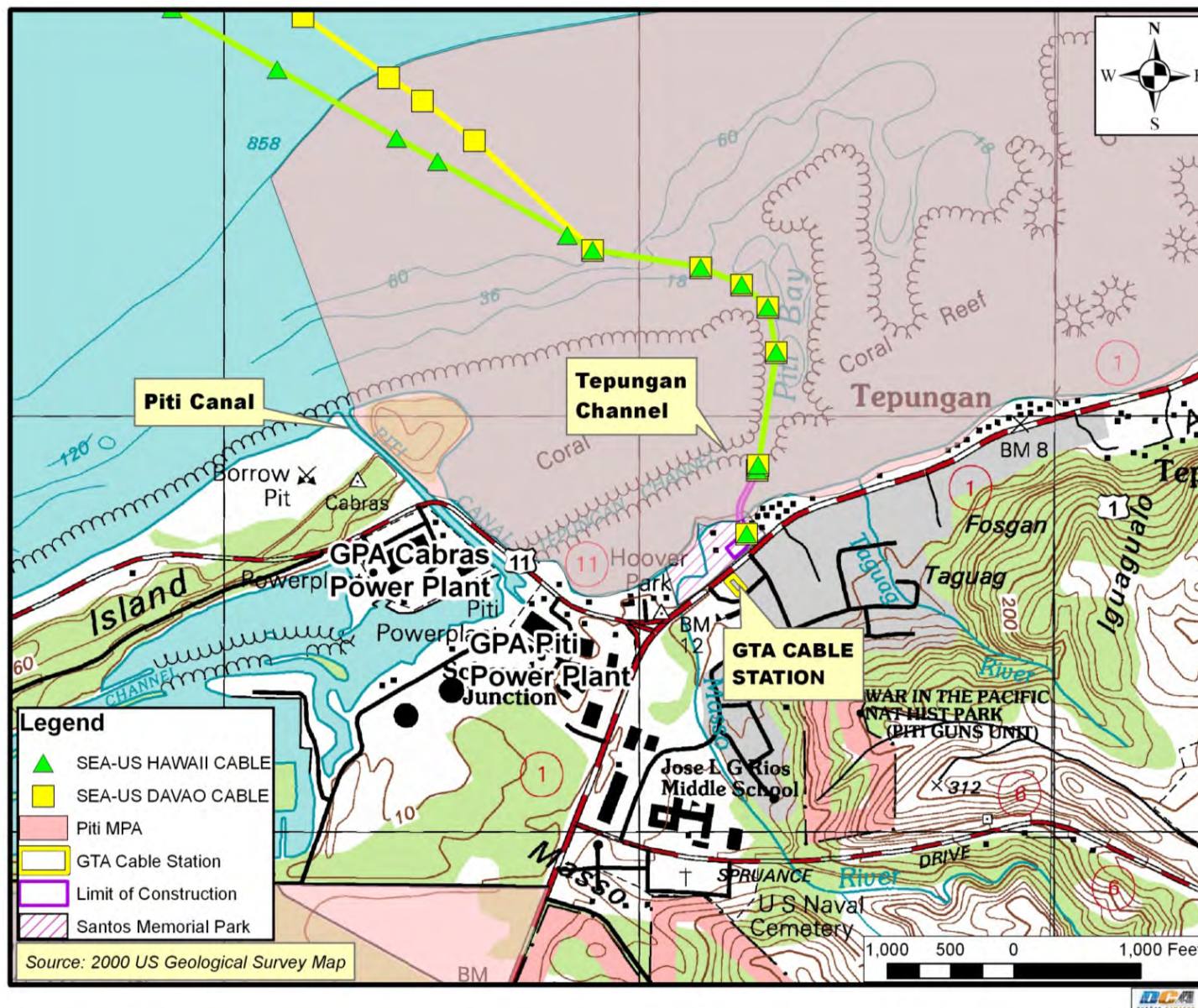


Figure 1. Site location map of GTA cable raceway and SEA-US cable landing site, Piti, Guam.

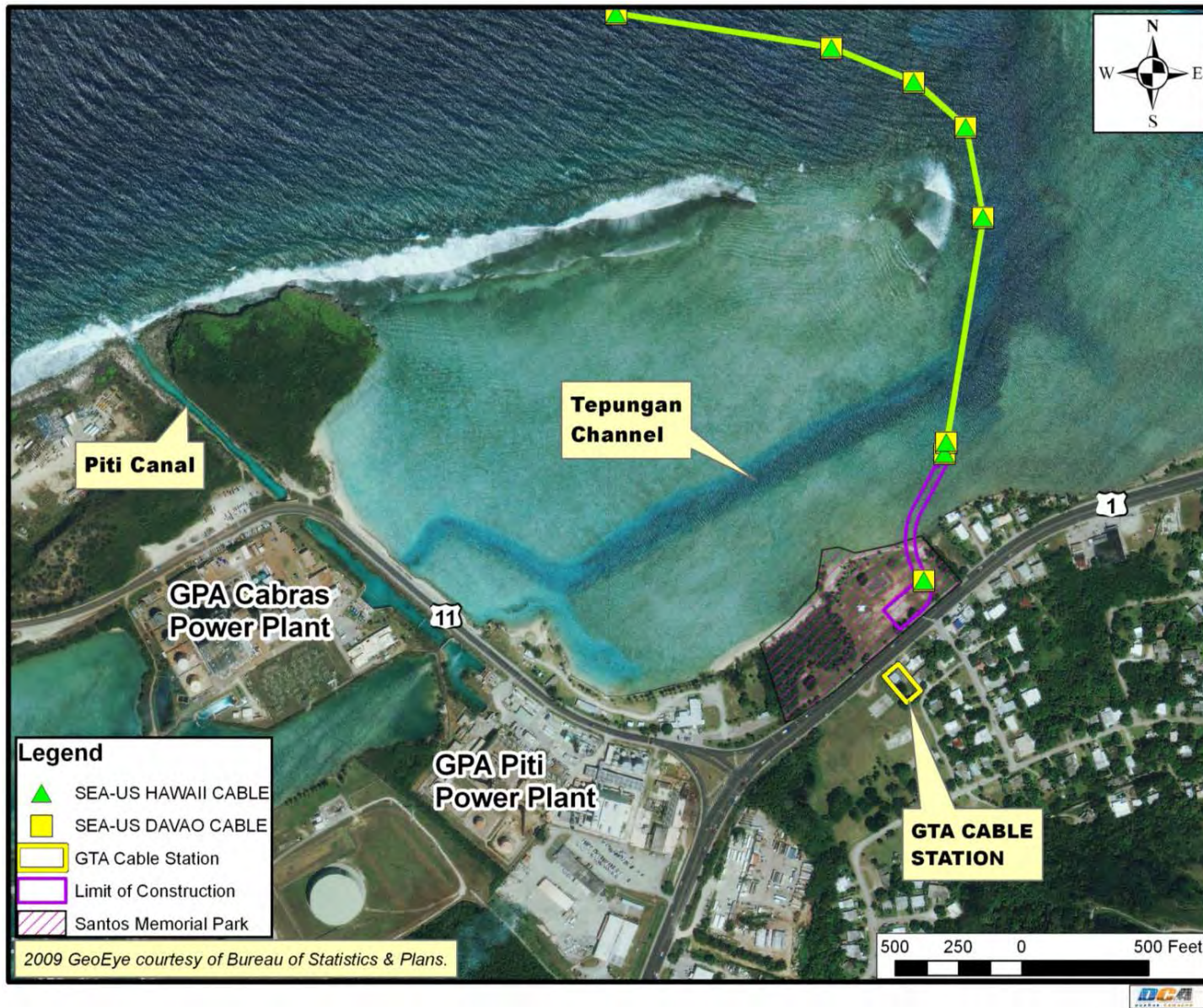


Figure 2. Aerial view of GTA cable raceway and SEA-US cable landing site, Piti, Guam.

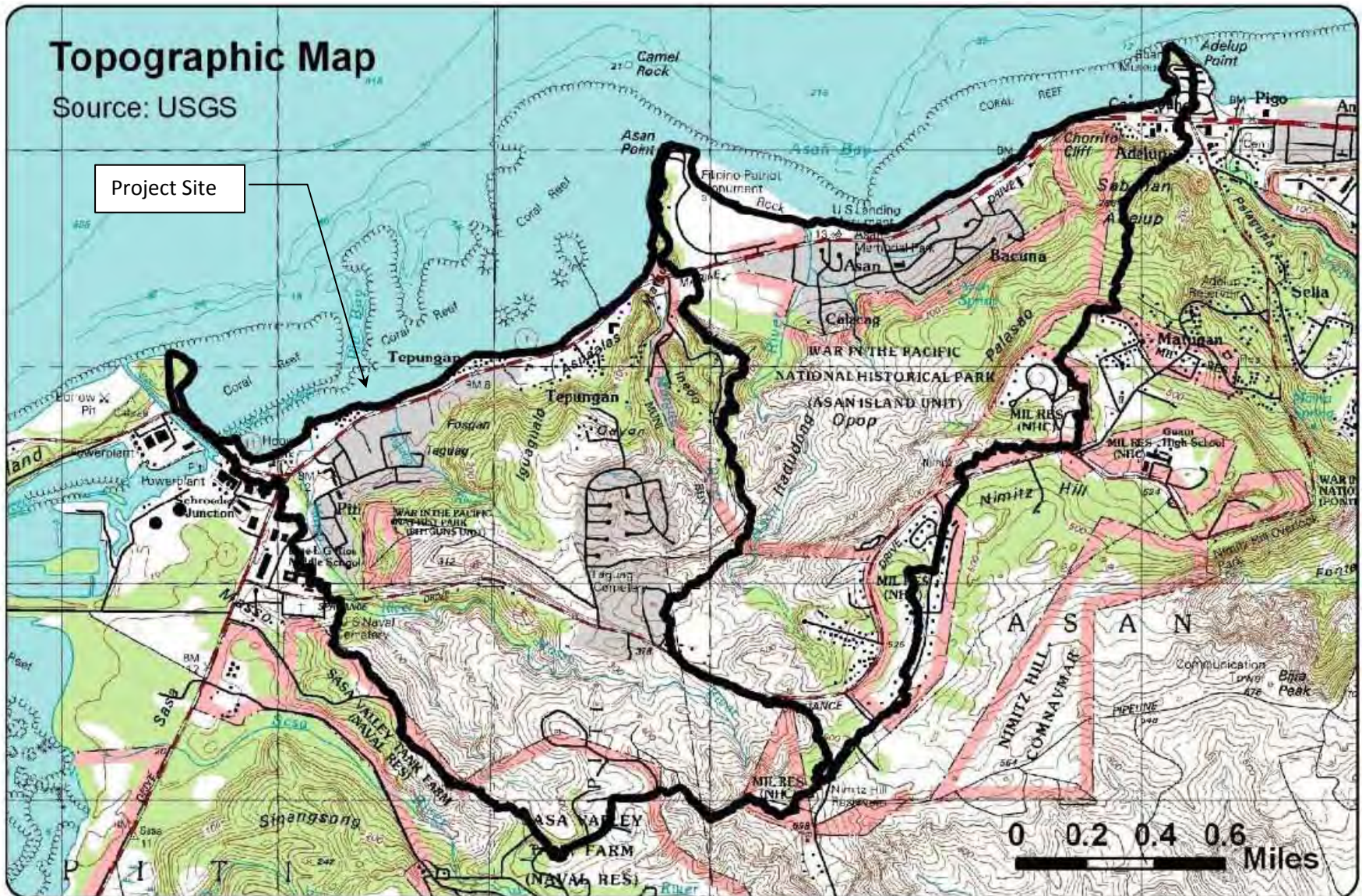


Figure 3. Asan-Piti Watershed Map (Taken from Kottermair, 2012).

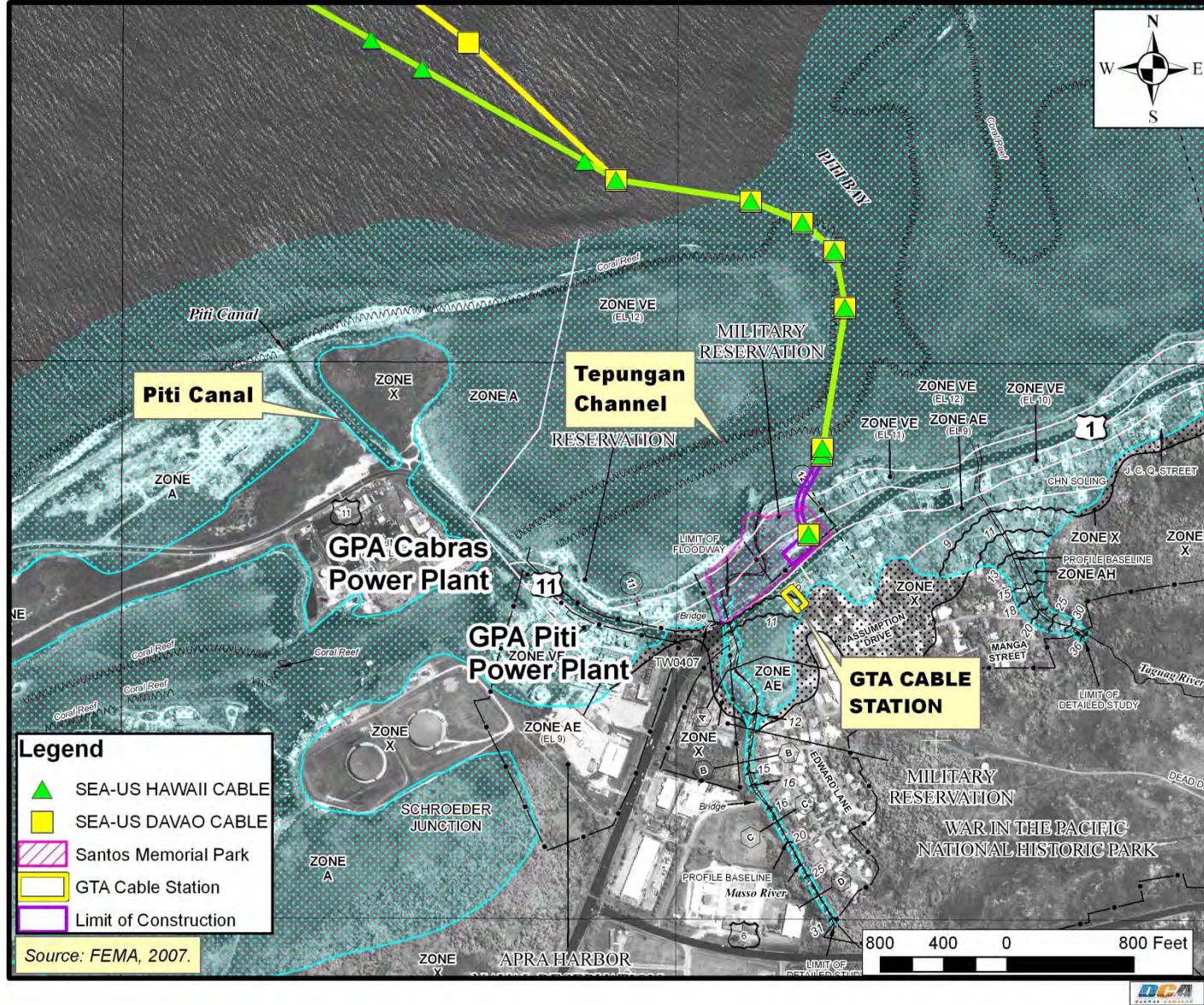


Figure 4. Flood hazard map of the project site, Santos Park, Piti (Taken and adapted from FEMA, 2007).

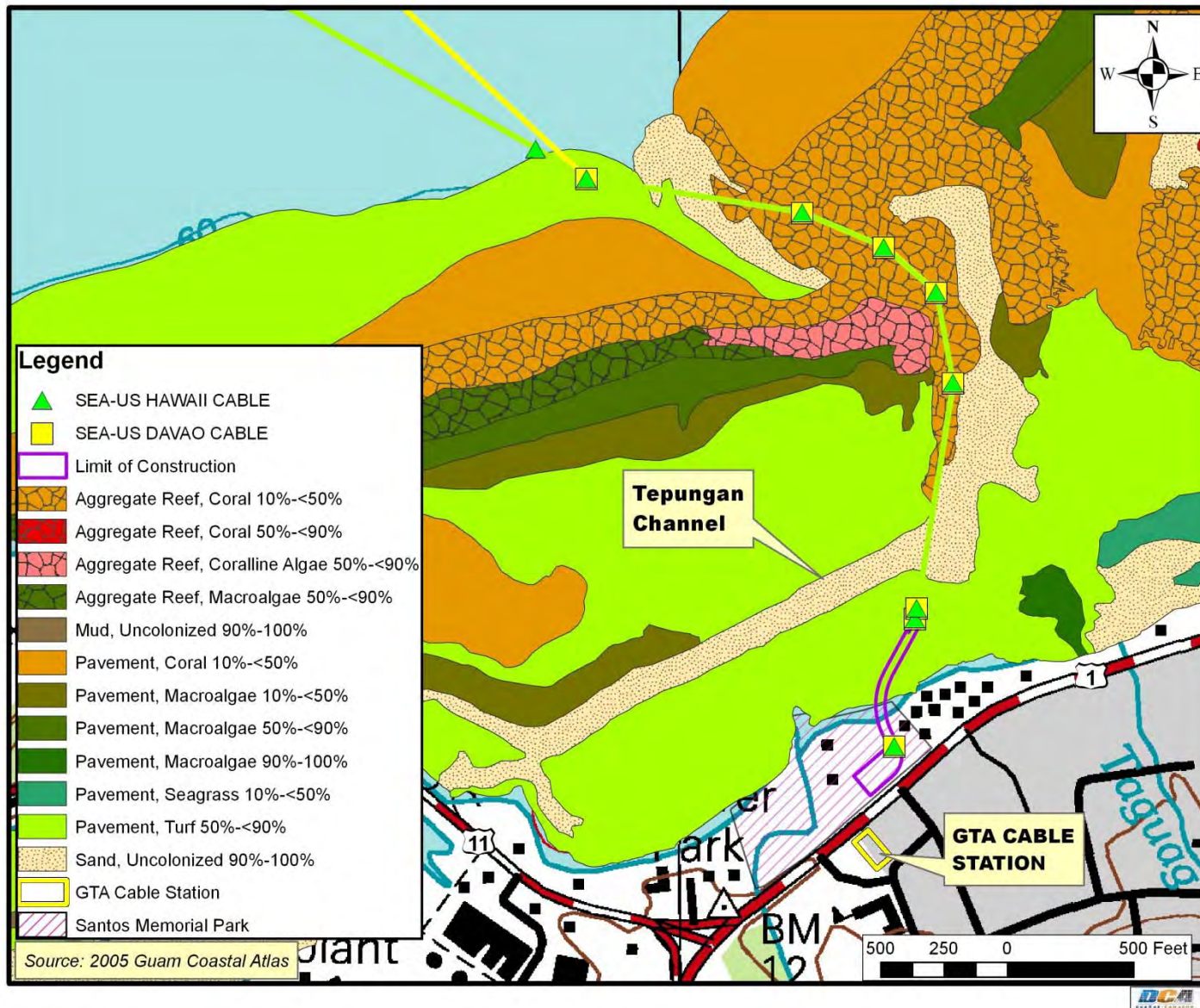


Figure 5. Benthic habitat map of project site, Tepungan, Piti, Guam (Adapted from Burdick, 2005).

EXHIBIT A - Figure 1



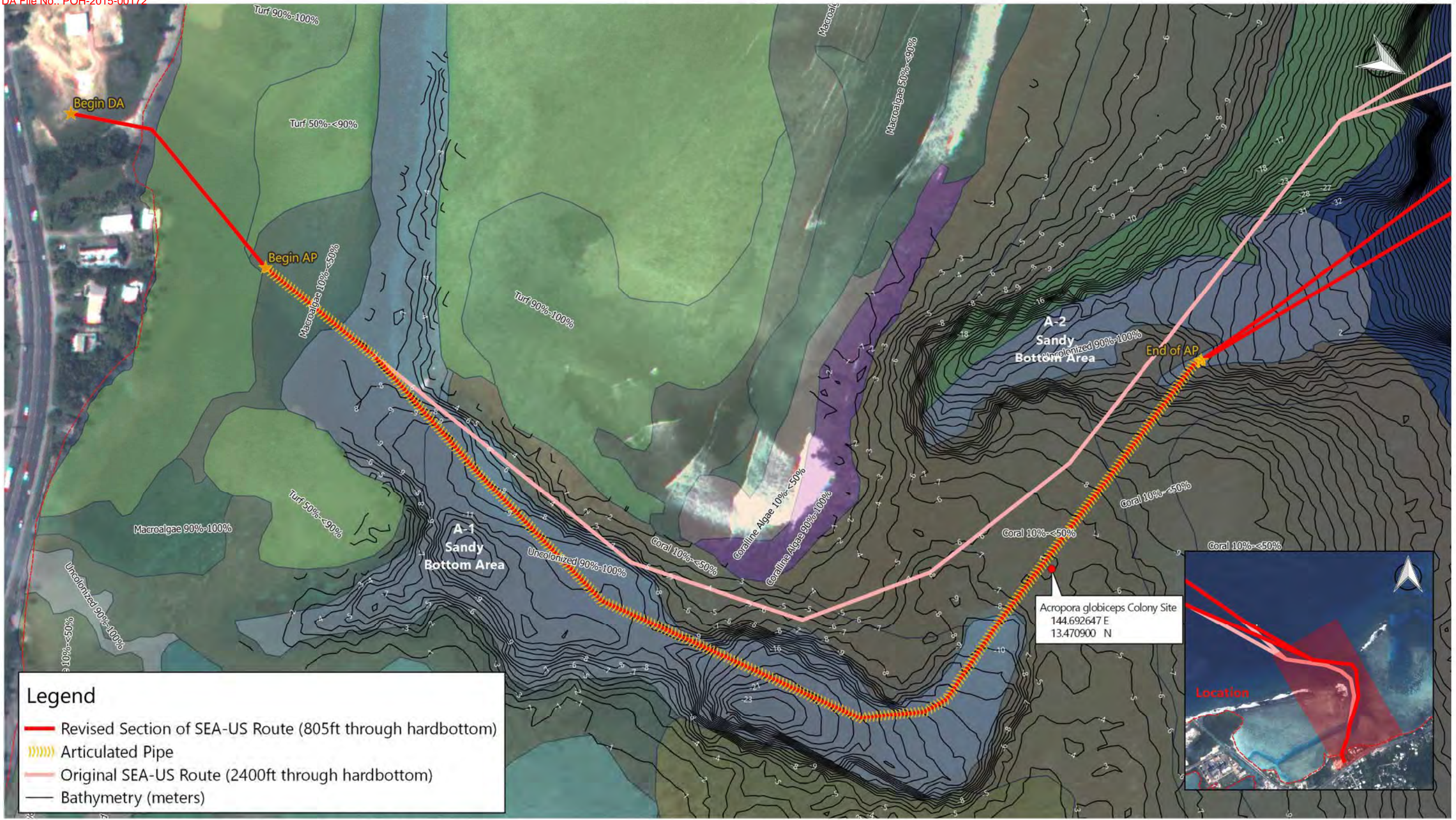
Legend

- Revised Section of SEA-US Route (805ft through hardbottom)
- Original SEA-US Route (2400ft through hardbottom)
- 3 Nautical Mile Limit
- Bathymetry (feet)

New SEA-US Cable Route from Piti Landing Site Out to Three Nautical Miles



EXHIBIT A - Figure 2



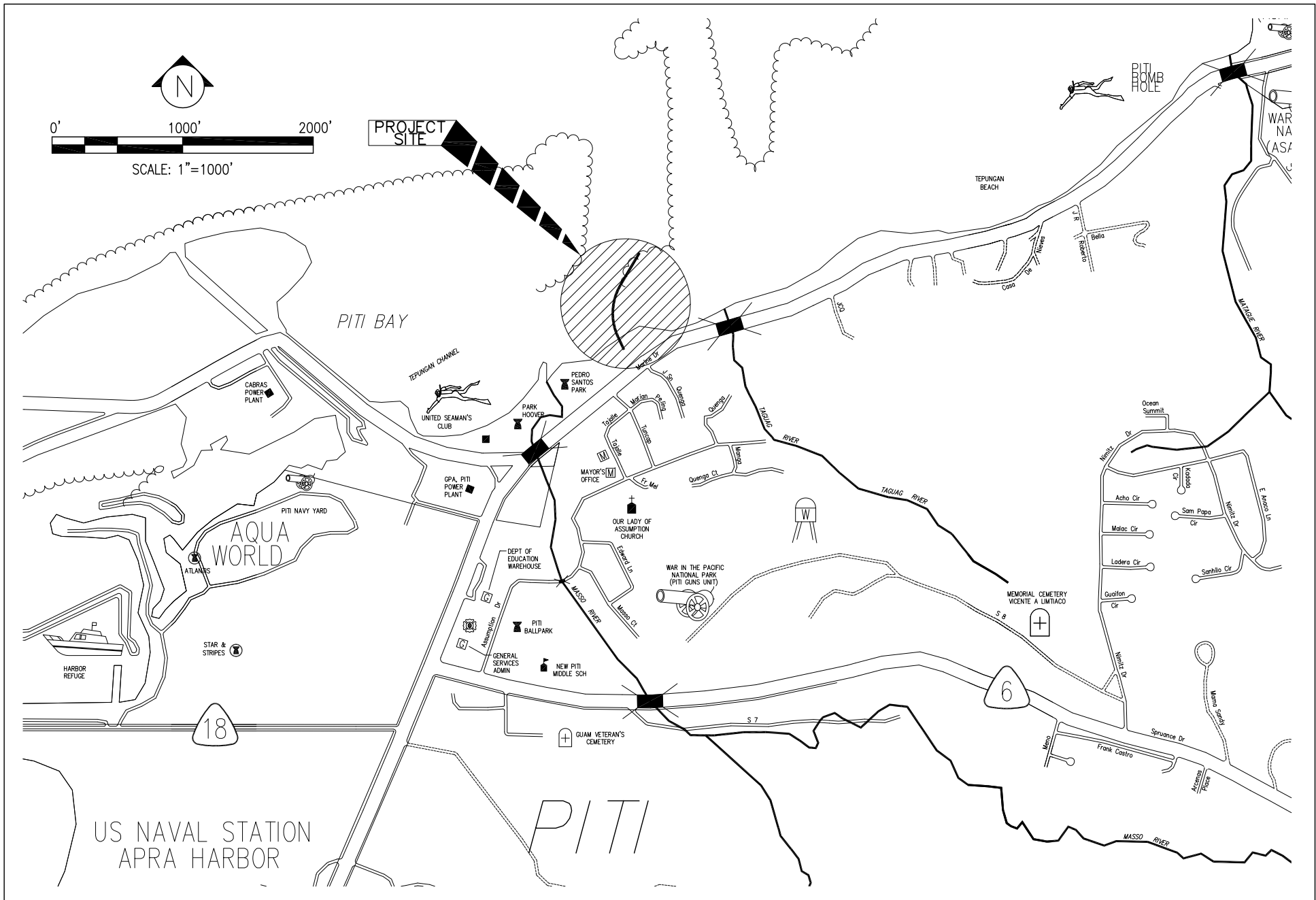
Acropora globiceps Colony Site
 144.692647 E
 13.470900 N

Legend

- Revised Section of SEA-US Route (805ft through hardbottom)
- ⋯ Articulated Pipe
- Original SEA-US Route (2400ft through hardbottom)
- Bathymetry (meters)

New SEA-US Route, Piti, Guam with Benthic Habitat Overlay

Benthic Habitat Data: From Pacific Islands Benthic Habitat Mapping Center in the School of Ocean and Earth Science and Technology at the University of Hawai'i at Mañoa. 5m Multibeam. 2003-2007.



Vicinity Map

Datum: Mean lower low water

POH-2016
 GTA
 624 North Marine Corps Drive
 Tamuning, GU 96913

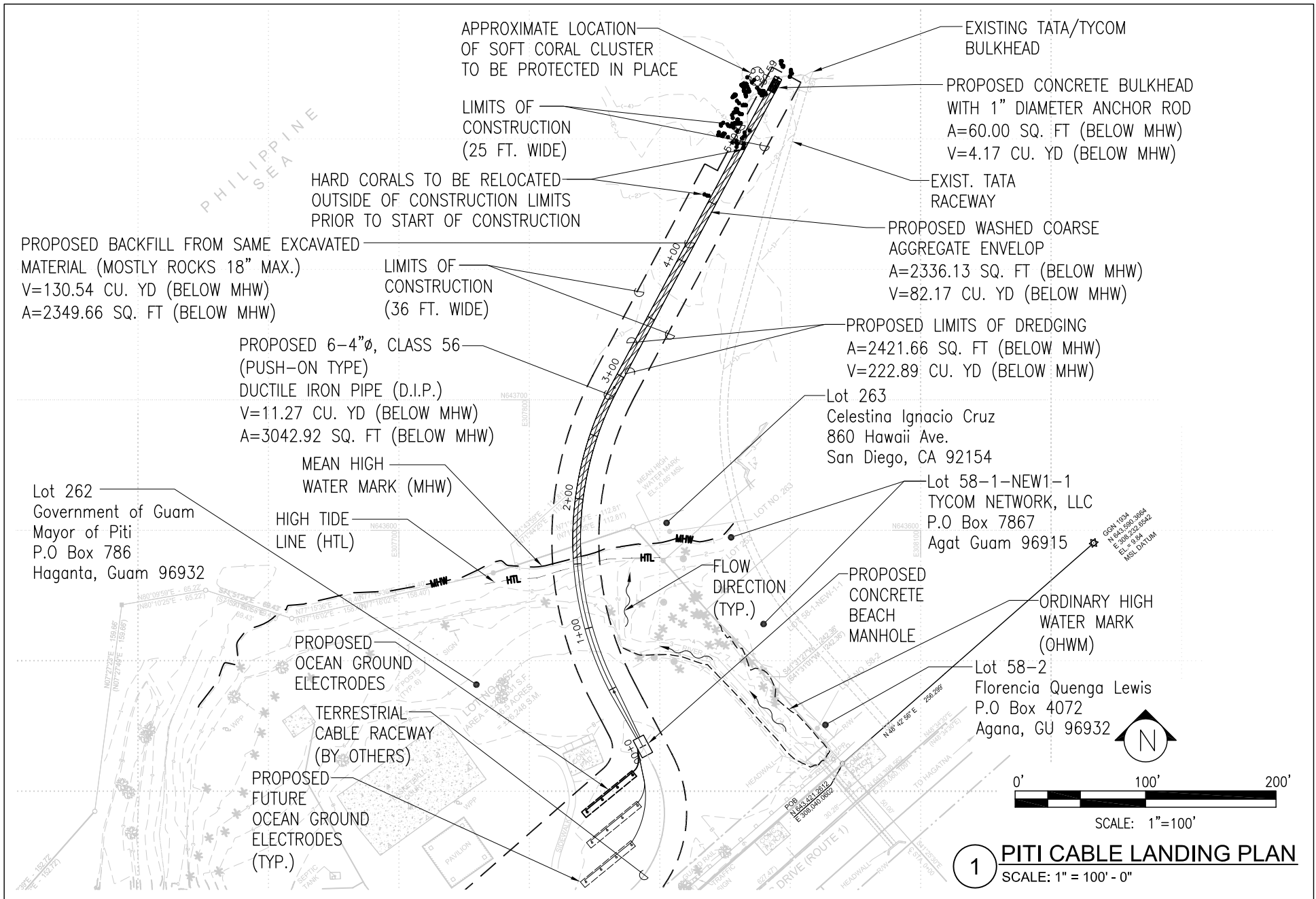
GTA Cable Raceway
 Route 1, Piti, Guam
 Sheet 1 of 6

June 2016
 Honolulu District Regulatory Guam Field Office

Received by KRD

Date: July 26, 2016 (Guam/ChST)

DA File No.: POH-2016-00102



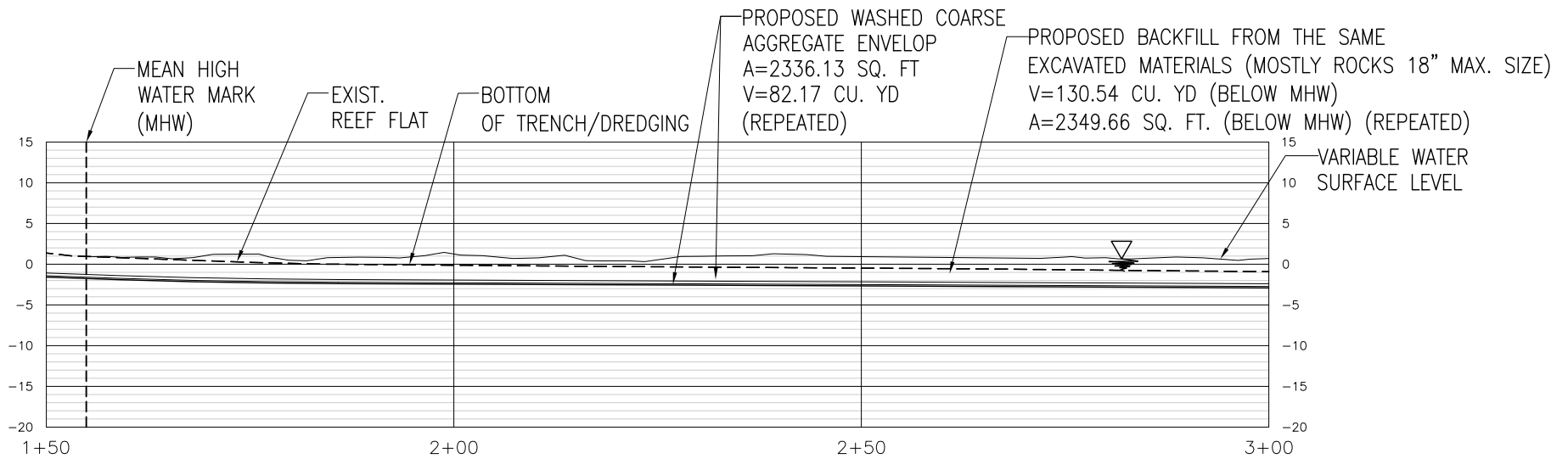
Plan View

Datum: Mean lower low water

POH-2016
GTA
624 North Marine Corps Drive
Tamuning, GU 96913

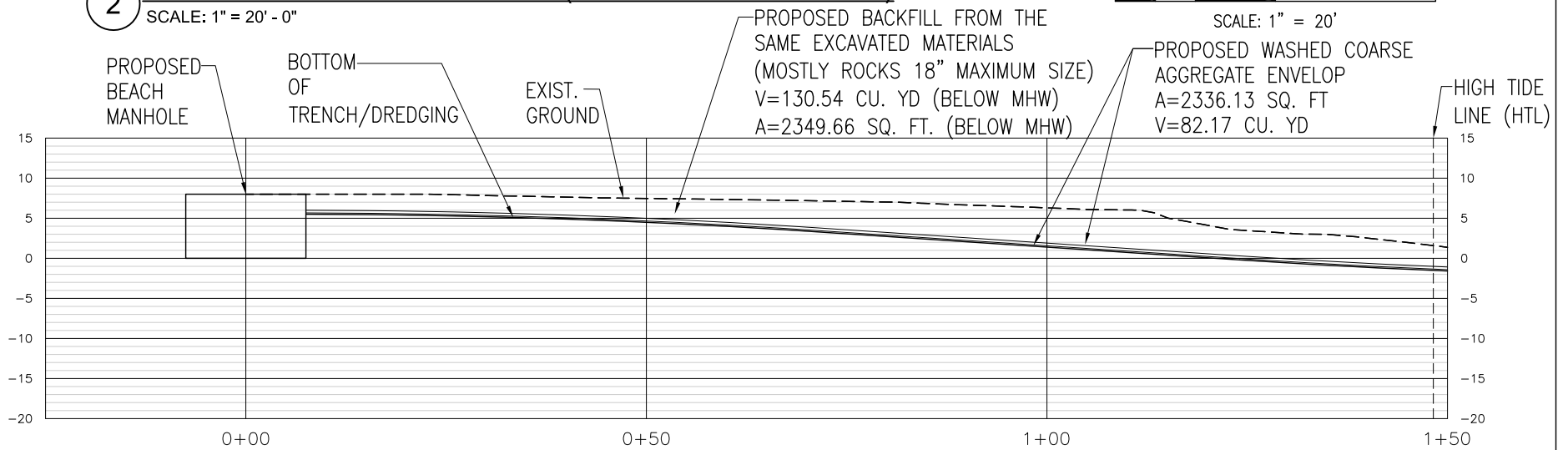
GTA Cable Raceway
Route 1, Piti, Guam
Sheet 2 of 6
US Army Corps of Engineers
Honolulu District Regulatory Guam Field Office
Received by KR D

Date: July 26, 2016 (Guam/ChST)
DA File No.: POH-2016-00102



2 PITI CABLE LANDING PROFILE (STA. 1+50 TO STA 3+00)

SCALE: 1" = 20' - 0"



1 PITI CABLE LANDING PROFILE (STA. 0+00 TO STA 1+50)

SCALE: 1" = 20' - 0"

Trench Profile (1 of 2)

Datum: Mean lower low water

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GTA
624 North Marine Corps Drive
Tamuning, GU 96913

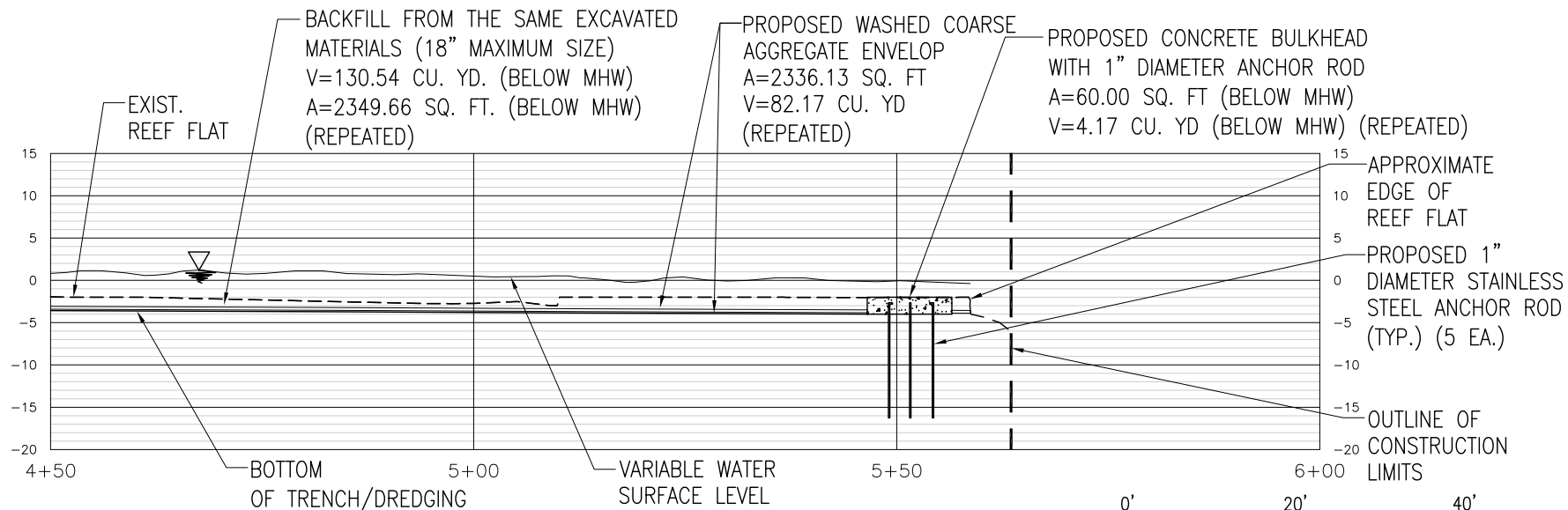
GTA Cable Raceway
Route 1, Piti, Guam
Sheet 3 of 6

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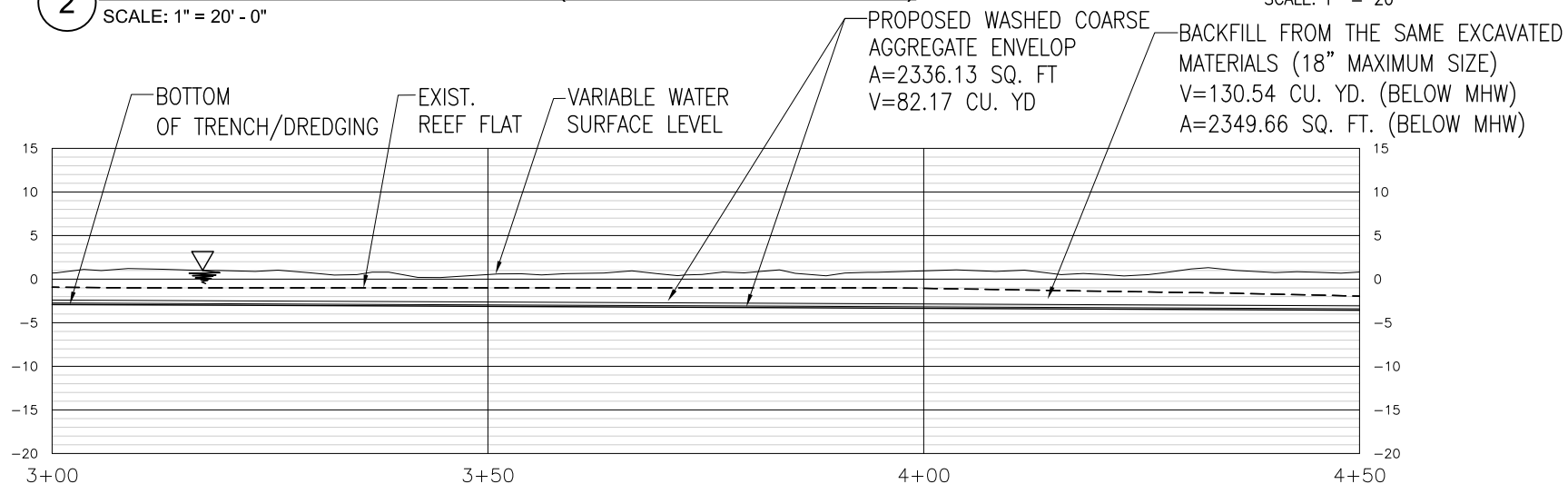
Date: July 26, 2016 (Guam/ChST)

DA File No.: POH-2016-00102



2 PITI CABLE LANDING PROFILE (STA. 4+50 TO STA 6+00)

SCALE: 1" = 20' - 0"



1 PITI CABLE LANDING PROFILE (STA. 3+00 TO STA 4+50)

SCALE: 1" = 20' - 0"

Trench Profile (2 of 2)

Datum: Mean lower low water

POH-2016
GTA
624 North Marine Corps Drive
Tamuning, GU 96913

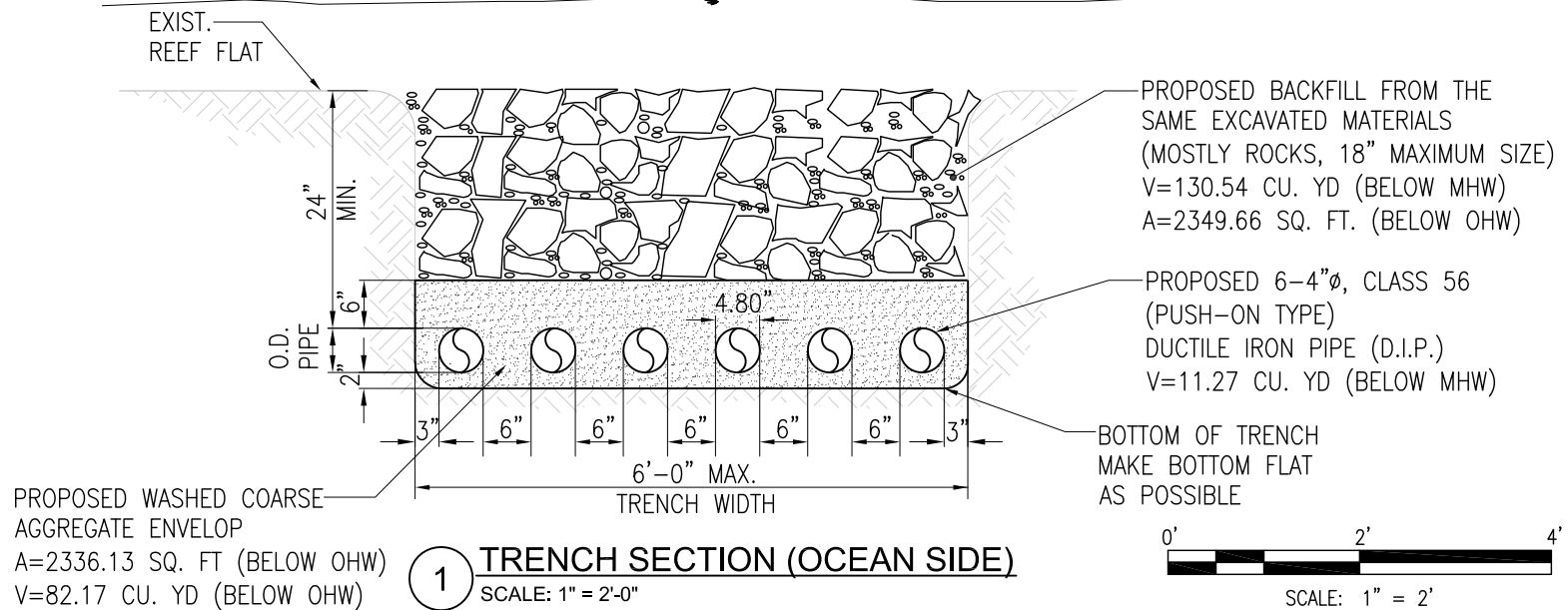
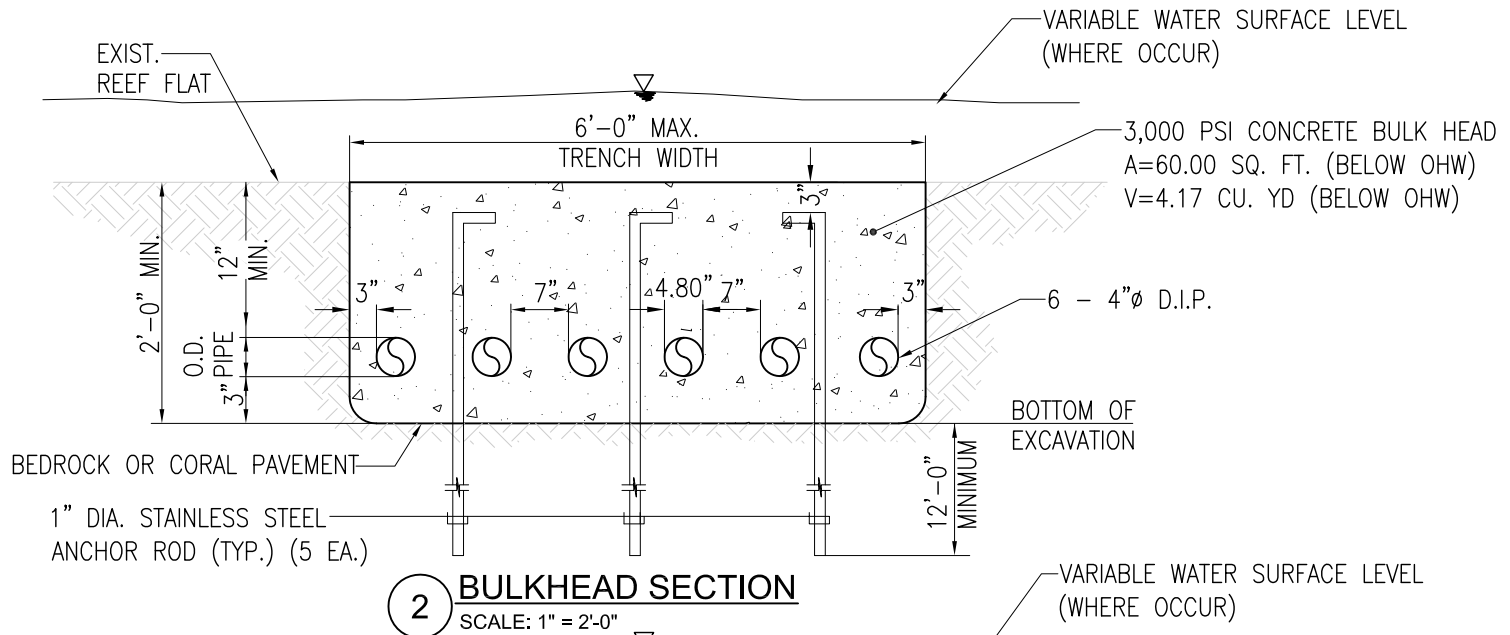
GTA Cable Raceway
Route 1, Piti, Guam
Sheet 4 of 6

US Army Corps of Engineers
Honolulu District Regulatory Guam Field Office

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DA File No.: POH-2016-00102



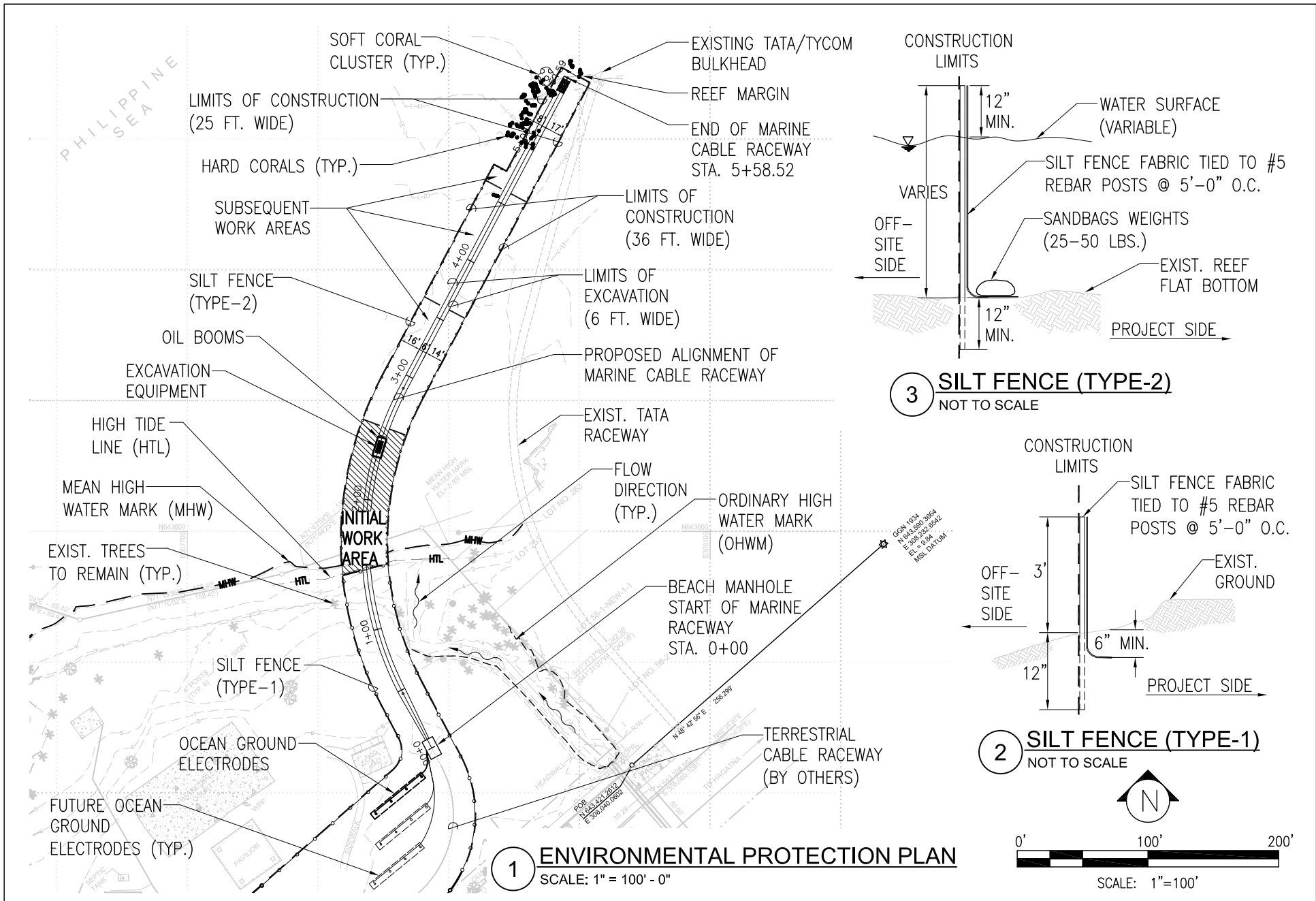
Trench and Bulkhead Section

Datum: Mean lower low water

POH-2016
GTA
624 North Marine Corps Drive
Tamuning, GU 96913

GTA Cable Raceway
Route 1, Piti, Guam
Sheet 5 of 6
June 2016
Honolulu District Regulatory Guam Field Office

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Date: July 26, 2016 (Guam/ChST)
DA File No.: POH-2016-00102



Environmental Protection Plan

Datum: Mean lower low water

POH-2016
GTA
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Tamuning, GU 96913

GTA Cable Raceway
Route 1, Piti, Guam
Sheet 6 of 6
June 2016
Honolulu District Regulatory Guam Field Office

US Army Corps of Engineers
Received by KRD
Date: July 26, 2016 (Guam/ChST)
DA File No.: POH-2016-00102

Coral Transplant and Monitoring Plan for the GTA Conduit Installation, Piti, Guam

Prepared for



624 N. Marine Corps Drive
Tamuning, Guam 96913

and

NEC Orchestrating a brighter world
NEC CORPORATION OF AMERICA
6536 N. State Hwy 161
Irving, TX 75039

Prepared by



Dueñas, Camacho & Associates, Inc.
238 East Marine Corps Drive
Suite 201 Diamond Plaza
Hagatna, Guam 96910

Revised November 2016

US Army Corps of Engineers
Honolulu District Regulatory Guam Field Office
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1 PURPOSE OF AND NEED FOR PROPOSED ACTION

GTA proposes to construct a cable raceway in Pedro Santos Memorial Park (Lot 262) and the adjacent Tepungan reef flat (Figure 1). The project would construct a 6 ft wide by 404 ft long by 3 ft deep trench on the reef flat from the mean high water mark (MHW) to the shoreward margin of the channel (Figure 4). The trenching would occur within a 36 ft wide corridor, which would taper to a 25 ft corridor for the final 90 ft length of the trench. The corridor was reduced in size in order to avoid corals within and along the western flank of the original corridor limits.

1.1 Summary of Proposed Action

The project proposes to install six conduits to receive submarine fiber-optic cables, and shortly after, land two new submarine cables in two of the conduits for the Southeast Asia-U.S. (SEA-US) telecommunication system linking Asia with Guam, Hawaii and California. The project is needed to complete the Guam link of the SEA-US system with Asia and the rest of the U.S. The four spare conduits are needed to accommodate future cable landings anticipated by GTA.

The project will dredge a trench (3 ft deep by 6 ft wide by 404 ft long) on the reef flat, from the mean high water mark to the shoreward edge of the Tepungan Channel. Six 4.8-inch diameter ductile iron conduits will be installed in the trench. The trench will be backfilled and a concrete bulkhead (6 ft wide by 10 ft long) will be installed to keep the conduits in place. Shortly after, two fiber-optic marine cables will be landed through two of the conduits and pulled to shore where they will be spliced to land cables at a new beach manhole located above the high tide line and outside the Guam Seashore Reserve.

1.2 Location

Guam is a U.S. territory and the largest and southernmost island in the Mariana Islands archipelago. The project site is in the eastern portion of Pedro G. Santos Memorial Park (Lot 262), an approximately 6.5-acre parcel located in the Municipality of Piti, just east of Apra Harbor on the western coast of Guam (Figure 1). The proposed cable raceway would be constructed in Lot 262 and on the reef flat offshore from the Park. Santos Park is located east of the Guam Power Authority Cabras and Piti Power Plants, and north of the GTA Cable Station site in Lot 5NEW-1, Block 2.

1.3 BACKGROUND INFORMATION

1.3.1 Selected Transplant Corals

The following species of corals will be transplanted from the construction corridor: *Pocillopora damicornis*, *Porites* spp., and *Favia* sp. A total of 42 colonies would be relocated from the impact area (Figure 5). An additional 14 corals are located near the western margin of the construction corridor and the northern edge of the reef margin, and would be moved because of their proximity to the construction zone.

The majority of the corals for transplanting are *Pocillopora damicornis*, with 30 colonies ranging from less than 5 cm up to 15 cm in diameter. Three *Porites* spp. colonies are proposed for relocating: one colony at less than 5 cm in diameter, one approximately 15 cm, and one large colony of approximately 30 cm in diameter. A small *Favia* sp. colony, with a diameter of less than 5 cm, is also proposed for relocation. Two clusters of soft coral colonies (*Sinularia* sp.) exist in the vicinity of the construction site. One is outside, to the west, of the construction corridor and will not be relocated because of their massive collective size (2 m x 1 m), and instead will be protected in place. Primary protection measures are to avoid the corals while working in the area. In the event that workers need to work close to these corals, they may be further protected by a temporary surround cage constructed of wire mesh. The other soft coral colony is directly in the path of the construction corridor located just seaward of the bulkhead. These soft corals exist as a colony on a rock that is also too large to move. Rather than destroy these corals, an attempt will be made to relocate these soft corals to the transplant site either by chipping them off the large rock and gluing them to other rocks within the transplant site with a two-part underwater epoxy (i.e., Sea Goin' Poxy Putty or Splash Zone). In the event that the soft corals cannot be effectively chipped off the large rock, they will be sliced off at their base and placed in holes or crevices and secured with epoxy within the transplant site to hold them in place.

1.3.2 Proposed Coral Transplant Site

The proposed coral transplant site is located approximately 98 ft (30 m) west of the western margin of the 36 ft construction corridor, and about 130 ft (40 m) or more from the corals that will be transplanted (Figure 3). The coordinates of the transplant site are Latitude 13.46624°N, Longitude 144.69302°E. The transplant site was investigated briefly during the marine survey by Kerr and Burdick (2016). The topography is variable, ranging from areas of flat terrain to rubble areas with small boulders. Burdick (2005) mapped the benthic habitat in this area as turf pavement (Figure 3), but the site survey indicates it is mostly rugose reef pavement (Pers. comm., D. Burdick). The site is located at approximately -2 to -4 ft water depth (Figure 4), and supports the same common species as those in the source location, i.e., *Pocillopora damicornis*, *Leptastrea purpurea*, and *Porites* sp. (Appendix A, Photographs).

1.4 TRANSPLANT METHODOLOGY

The transplanting will be performed manually with pre-inspected hand tools that are free of grease or pollutants. Typical equipment will include pry bars, chisels, and mallets, which will be used to carefully remove the colony with its attached base from the consolidated reef platform. Where feasible, the rock will be chipped to a smaller size and moved with the attached colony. In most cases, however, the colony will be gently removed at the base, to avoid destruction of the reef substrate. In some cases, however, a pneumatic hammer may be used to extract larger rock features containing coral growth. The corals will be loaded into a basket and transported in fresh seawater underwater to the transplant site. The contractor will be required to extract, transport, and transplant the corals in a manner that would not cause them damage and minimize their stress.

The transplant recipient site will be surveyed in advance of coral extraction and likely attachment points for each specific coral identified and tagged. Recipient sites for each coral will be selected based on the availability of hard substrate free of sand and rubble, and adequate depth to ensure corals will not be exposed at extreme low tides. Existing crevices and stable areas free of loose rocks and debris will serve as the attachment point for corals. Available pockets or depressions in the substrate are preferred, but not necessary. Prior to transplanting, substrate will be prepared by scrubbing the receiving area with a wire brush to remove loose debris and any surface algae growth. Masonry nails will be hammered into the substrate on either side of the coral prior to its placement. The coral will be tied to these nails using either zip ties or nylon string. The base of the coral and the nails will then be affixed to the substrate with a two-part underwater epoxy (i.e., Sea Goin' Poxo Putty or Splash Zone). Both of these products have been successfully used in previous local coral transplant projects, as well as the coral nursery. This material dries within 45 min and, once dried, is inert and non-toxic to coral tissue. The material safety data sheets for these products are presented in Appendix B. Lastly, corals will be tagged, to ensure accuracy in recording observations of their performance during follow-up censuses.

1.5 MONITORING

Monitoring will occur over an 18-month period. The monitoring program will include written and photographic records of the coral's condition, i.e., species, diameter, health status and any other observations of scientific interest, and will follow a staggered plan of censusing, as follows: two days post-transplant (to add fixative, nails, etc., as needed), 2 weeks, 1 month, 3 months, 6 months, 1 year, 18 months. Adding additional fixative, securing nails, and replacing ties, as well as removal of overgrowing algal or sponges will be performed as maintenance during each trip, to maximize coral successful reestablishment.

The coral transplantation will be considered a success if 75% of the corals survive to three months and successfully remain affixed to the substrate. A brief written report will be submitted to the Guam Department of Agriculture Division of Aquatic and Wildlife Resources, the U.S. Army Corps of Engineers and the Guam Environmental Protection Agency, after each census.

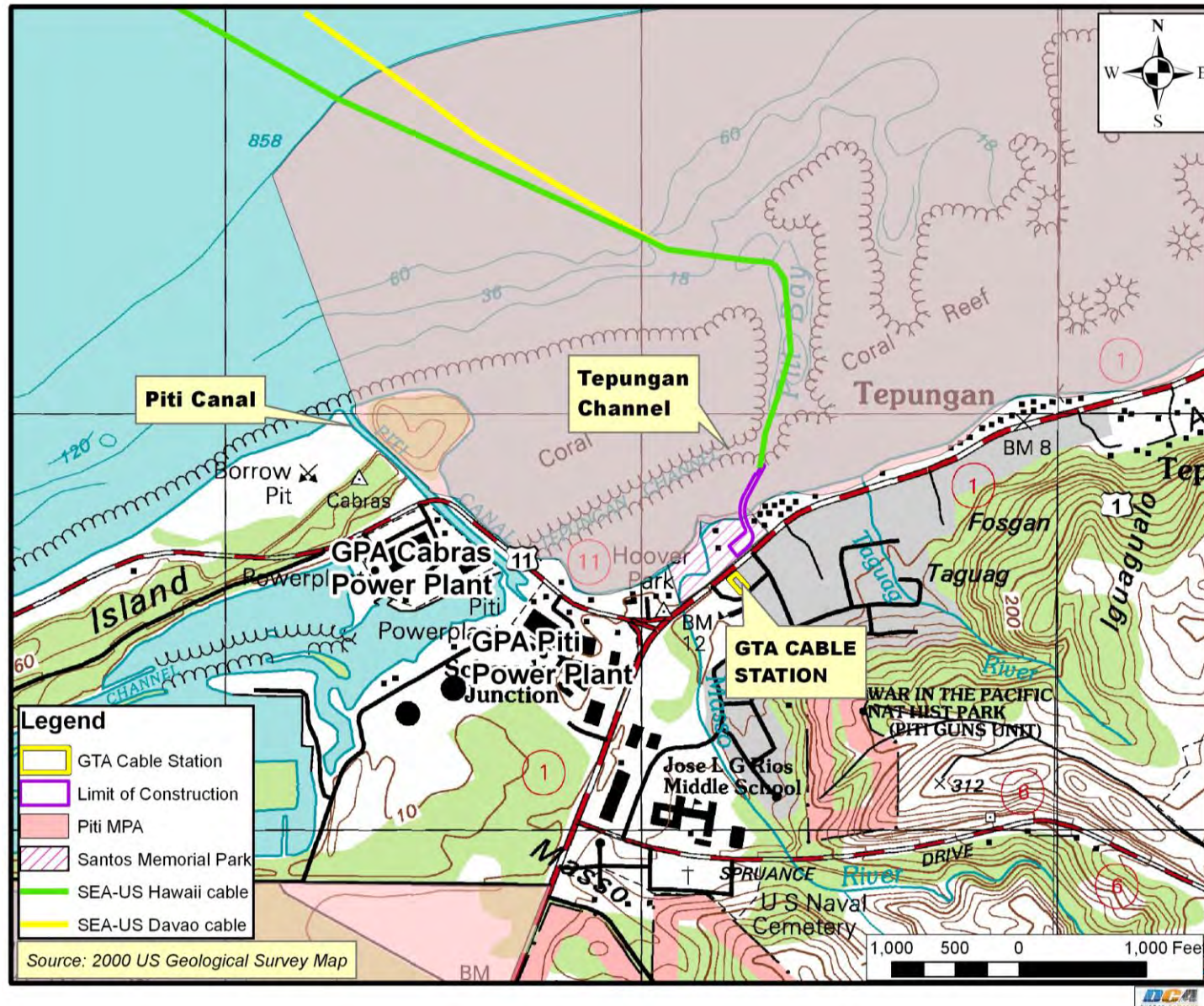


Figure 1. Site location map of GTA cable raceway and SEA-US cable landing site, Piti, Guam.

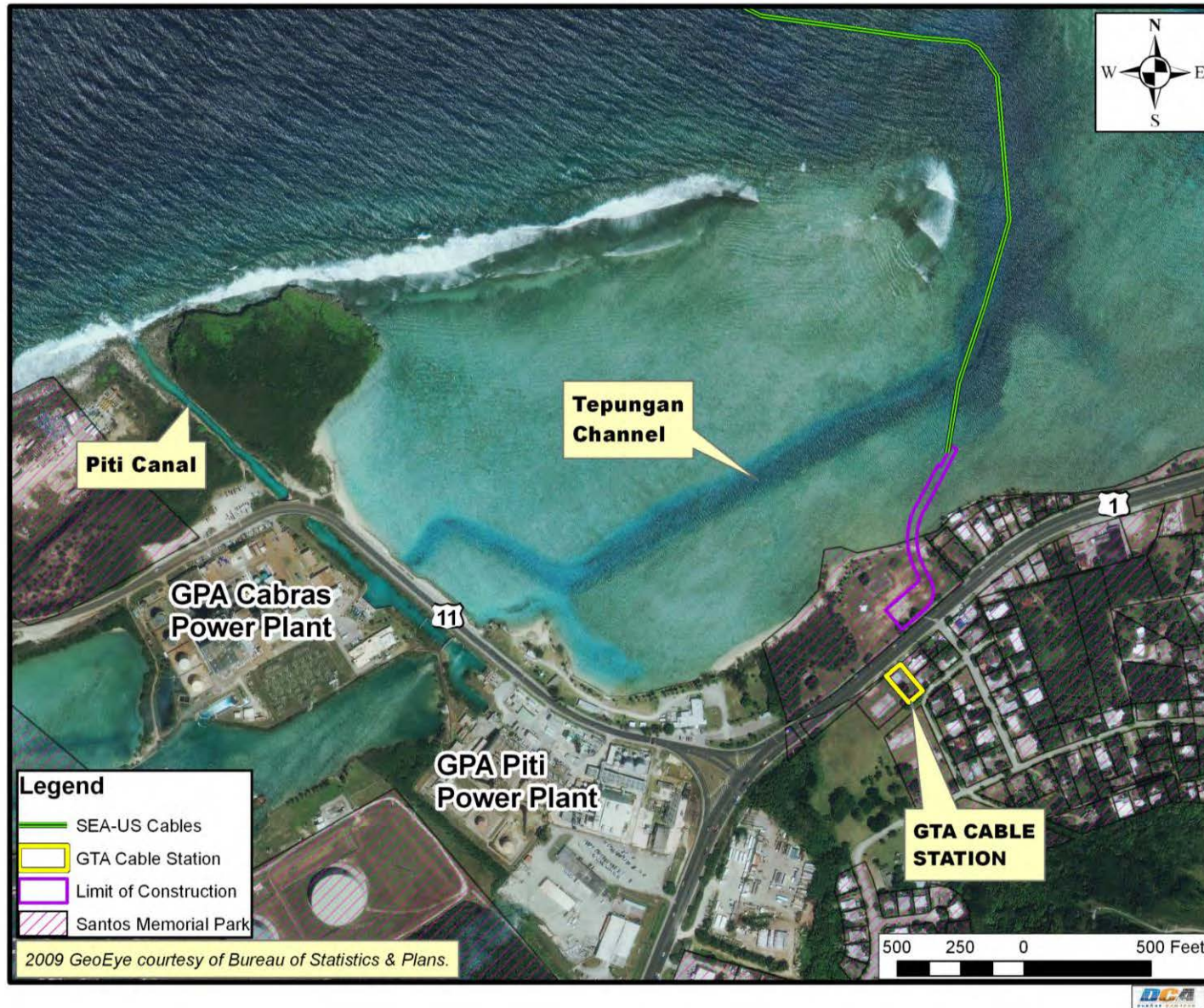


Figure 2. Aerial view of GTA cable raceway and SEA-US cable landing site, Piti, Guam.

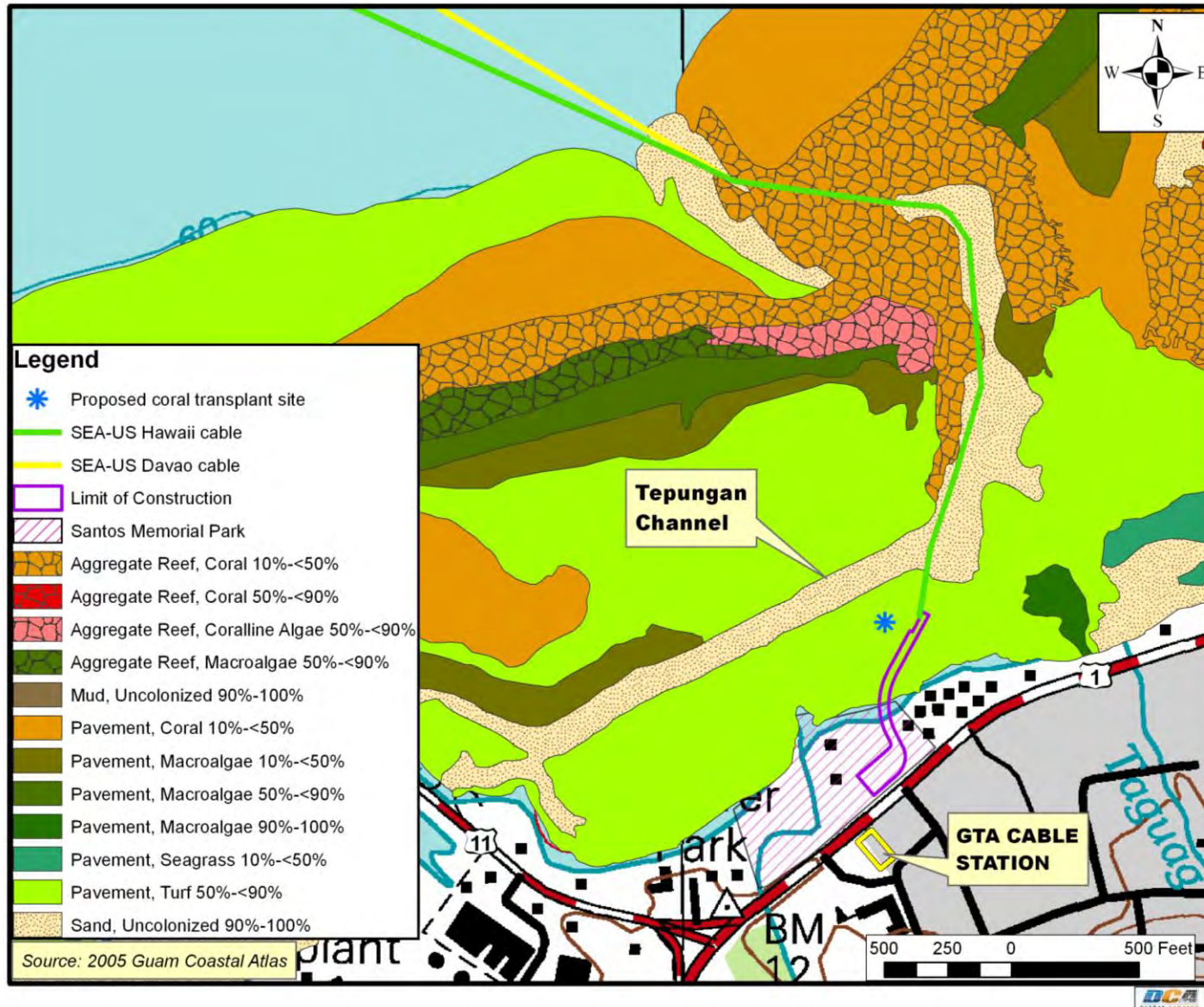


Figure 3. Benthic habitat map of GTA cable raceway and SEA-US cable landing site, Piti, Guam.

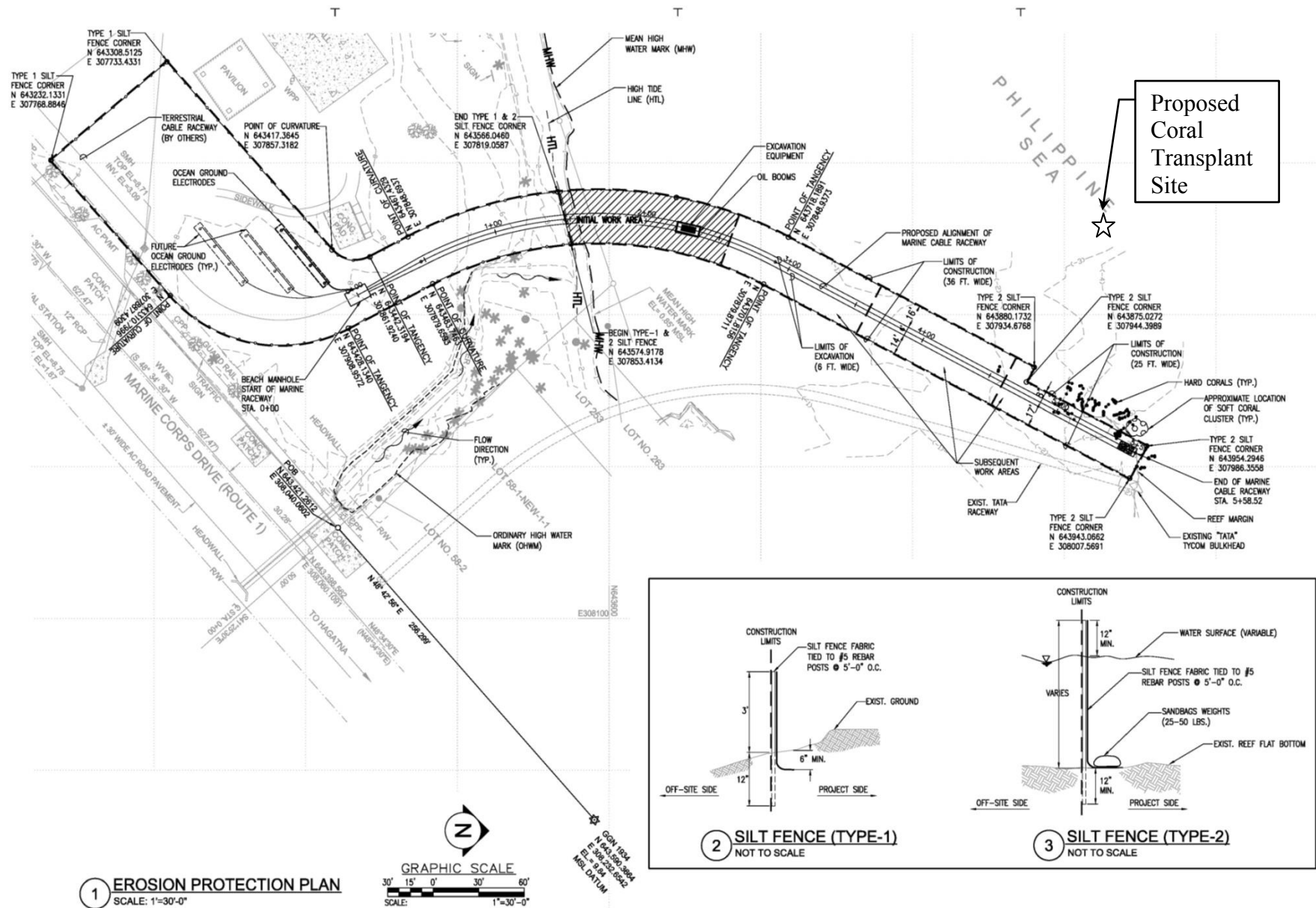


Figure 4. Plan view of GTA cable raceway showing proposed coral transplant site.

Figure A1. Location of corals along the proposed bulkhead corridor. *Pocillopora damicornis* (in red), *Porites* spp. (blue), *Goniastrea retiformis* (green), and *Favia* sp. (purple). The numerous (ca. 10/m²) and tiny (ca. 1 cm²) colonies of *Leptastrea purpurea* are not shown (see text for discussion).

Note added in draft: Green triangles indicate 21 additional small colonies of primarily *P. damicornis* between 5-15 cm in diameter for which only approximate locations (\pm 5 m) are reported.

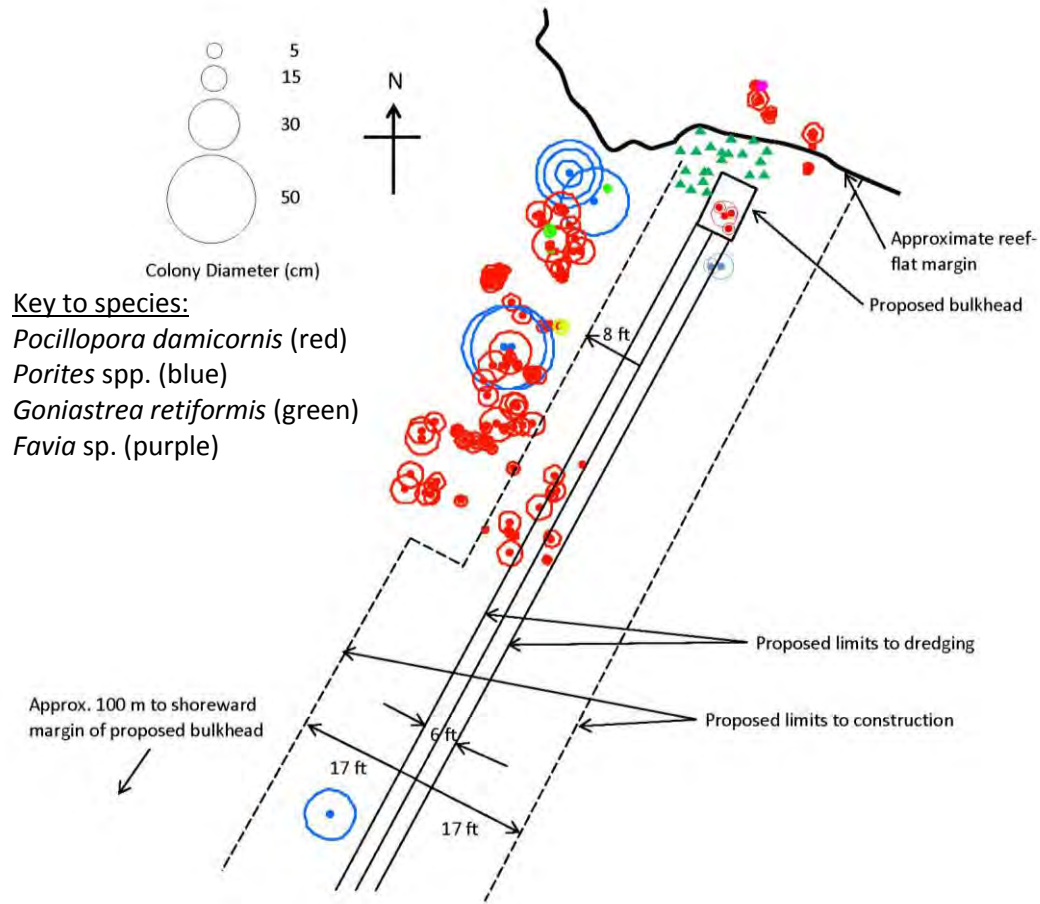


Figure 5. Plan view of GTA cable raceway showing corals in project corridor (Taken from Kerr and Burdick, 2016).

2 REFERENCES

Kerr, A.M. and D.R. Burdick. 2016. Marine Biological Survey for the Guam Telephone Authority Proposed Cable Landings, Piti, Guam. Prepared for Duenas, Camacho & Associates, Inc. June 2016.

APPENDIX A

Photographs of Potential Coral Transplant Site

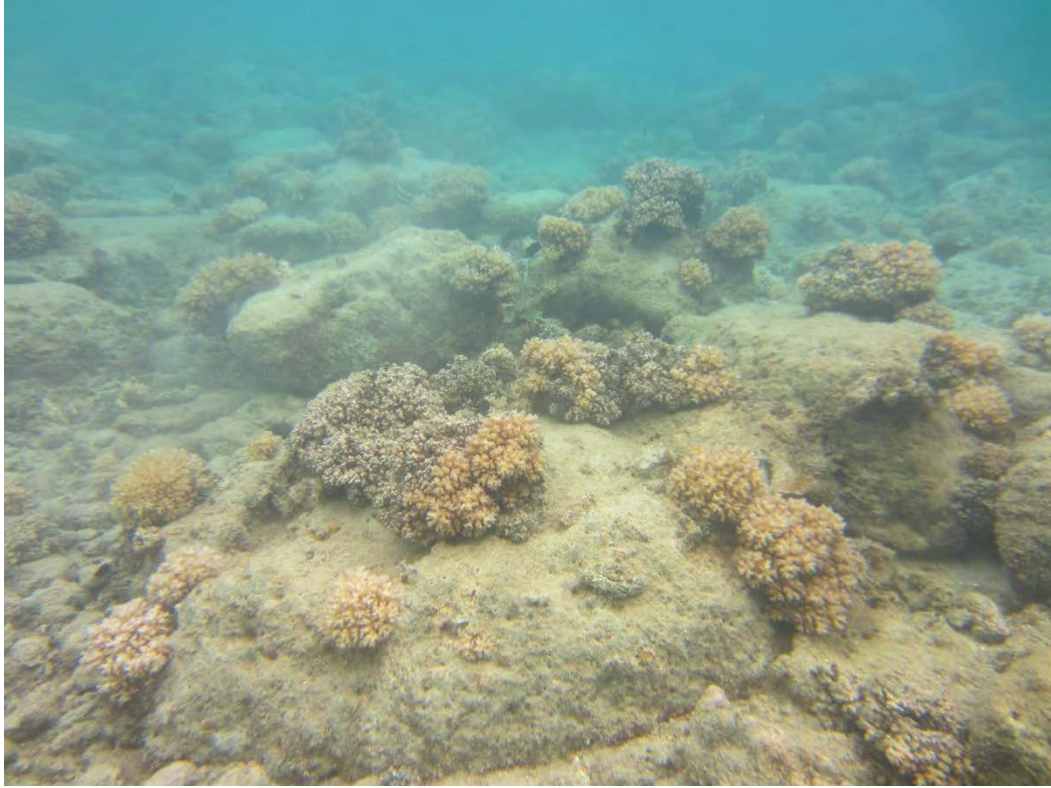


Figure 1. *Pocillopora damicornis* colonies on boulders at proposed transplant site.



Figure 2. Landscape view of proposed transplant site.

APPENDIX B

Material Safety Data Sheets

PERMALITE PLASTICS CORP -- 1324 SEA GOIN POXY PUTTY PART A BASE -- 8030-00N029195

=====
Product Identification
=====

Product ID:1324 SEA GOIN POXY PUTTY PART A BASE
MSDS Date:12/01/1989
FSC:8030
NIIN:00N029195
Kit Part:Y
MSDS Number: BPCZB
=== Responsible Party ===
Company Name:PERMALITE PLASTICS CORP
Address:1537 MONROVIA AVE
City:NEWPORT BEACH
State:CA
ZIP:92663
Country:US
Info Phone Num:714-548-1137
Emergency Phone Num:714-548-1137
CAGE:14703

==== Contractor Identification ===
Company Name:PERMALITE PLASTICS CORP
Address:1537 MONROVIA AVE
City:NEWPORT BEACH
State:CA
ZIP:92663-2806
Country:US
CAGE:14703

=====
Composition/Information on Ingredients
=====

Ingred Name:EPICHLOROHYDRIN BI-PHENOL A; (BISPHENOL A/EPICHLOROHYDRIN)
CAS:25063-38-6

Ingred Name:ALIPHATIC MONOGLYCIDYL ETHER; (C8 AND C10 ALKYL GLYCIDYL
ETHERS)
CAS:68609-96-1

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:IRRITATION AND DERMATITIS. PROLONGED
OR REPEATED CONTACT OF LIQUID OR BREATHING OF VAPOR OR MIST MAY
CAUSE DELAYED AND SERIOUS INJURY SUCH AS ADVERSE REPRODUCTIVE
EFFECTS.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:IRRITATION AS NOTED. SKIN SENSITIZATION MAY BE
EVIDENCED BY RASHES.
Medical Cond Aggravated by Exposure:PRE-EXISTING SKIN ALLERGIES & EYE
DISORDERS MAY BE AGGRAVATED BY EXPOSURE.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. CALL PHYSICIAN.
SKIN: WASH THOROUGHLY WITH SOAP AND WATER. INGEST: INDUCE VOMITING
CALL PHYSICIAN. INHAL: REMOVE TO FRESH AIR.

=====
Fire Fighting Measures
=====

Flash Point Method:CC
Flash Point:200F,93C
Extinguishing Media:CO2, FOAM, DRY CHEMICAL, WATER SPRAY.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:DECOMPOSITION AND COMBUSTION PRODUCTS MAY
BE TOXIC.

=====
Accidental Release Measures
=====

Spill Release Procedures:TAKE UP WITH ABSORBENT MATERIAL AND SHOVEL
INTO APPROVED CLOSABLE WASTE DISPOSAL CONTAINER. FLUSH CONTAMINATED
AREA WITH WATER.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
Handling and Storage
=====

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DA File No.: POH-2015-00172

Handling and Storage Precautions:KEEP CONTAINER CLOSED WHEN NOT IN USE.
STORE IN A COOL DRY PLACE.
Other Precautions:DO NOT GET IN EYES, ON SKIN ON CLOTHING. DO NOT
BREATHE VAPOR. DO NOT TAKE INTERNALLY OR TASTE.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:NONE NECESSARY UNDER NORMAL USE. NIOSH/MSHA
APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .
Ventilation:GOOD LOCAL MECHANICAL EXHAUST. USE VENTILATION AS REQUIRED
TO CONTROL VAPORS.
Protective Gloves:IMPERVIOUS GLOVES.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:WEAR PROTECTIVE EQUIPMENT TO PREVENT
EXPOSURE & PERSONAL CONTACT.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING, AND BEFORE
EATING, DRINKING OR SMOKING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
Physical/Chemical Properties
=====

HCC:N1
Solubility in Water:NEGLIGIBLE
Appearance and Odor:THICK WHITE PASTE MILD ODOR.

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, ACIDS AND BASES. REACTION WITH SOME CURING AGENTS MAY
CREATE CONSIDERABLE HEAT.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:CO, CO2, ALDEHYDES.

=====
Disposal Considerations
=====

Waste Disposal Methods:PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN
COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

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DA File No.: POH-2015-00172

PERMALITE PLASTICS CORP -- 1324 SEA GOIN POXY PUTTY PART B CATALYST -- 8030-00N029195

=====
Product Identification
=====

Product ID:1324 SEA GOIN POXY PUTTY PART B CATALYST
MSDS Date:12/01/1989
FSC:8030
NIIN:00N029195
Kit Part:Y
MSDS Number: BPCYZ
=== Responsible Party ===
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Country:US
Info Phone Num:714-548-1137
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CAGE:14703

==== Contractor Identification ===
Company Name:PERMALITE PLASTICS CORP
Address:1537 MONROVIA AVE
City:NEWPORT BEACH
State:CA
ZIP:92663-2806
Country:US
CAGE:14703

=====
Composition/Information on Ingredients
=====

Ingred Name:TETRAETHYLENEPENTAMINE
CAS:112-57-2
RTECS #:KH8585000
Fraction by Wt: < 1%

Ingred Name:TRIETHYLENE TETRAMINE
CAS:112-24-3
RTECS #:YE6650000
Fraction by Wt: < 1%

Ingred Name:2,4,6-TRIS(DIMETHYLAMINO METHYL) PHENOL
CAS:90-72-2
RTECS #:SN3500000
Fraction by Wt: < 5%

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:SEVERLY IRRITATING TO SKIN & EYES.
HIGH CONCENTRATION OF VAPORS CAN CAUSE IRRITATION OF EYES & RESP
TRACT. LIQUID CAUSES DAMAGE TO MUCOUS MEMBRANES IF SWALLOWED.
PROLONGED OR REPEATED EXPOSURE MAY CAU SE ASTHMA & SKIN
SENSITIZATION OR OTHERALLERGIC REACTIONS.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:IRRITATIONS AS NOTED. SKIN SENSITIZATION MAY BE
EVIDENCED BY RASHES.
Medical Cond Aggravated by Exposure:PRE-EXISTING SKIN ALLERGIES AND EYE
DISORDERS MAY BE AGGRAVATED BY EXPOSURE.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. CALL PHYSICIAN.
SKIN: WASH THOROUGHLY WITH SOAP & WATER. INGEST: DO NOT INDUCE
VOMITING. DILUTE WITH WATER. CALL PHYSICIAN. INHAL: REMOVE TO FRESH
AIR.

=====
Fire Fighting Measures
=====

Flash Point Method:COC
Flash Point:255F,124C
Extinguishing Media:FOAM, CO2, DRY CHEMICAL, WATER SPRAY.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:DECOMPOSITION AND COMBUSTION PRODUCTS MAY

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BE TOXIC.

===== Accidental Release Measures =====

Spill Release Procedures:TAKE-UP WITH ABSORBENT MATERIAL & SHOVEL INTO APPROVED CLOSABLE WASTE DISPOSAL CONTAINER. FLUSH CONTAMINATED AREA WITH WATER.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER CLOSED WHEN NOT IN USE. STORE IN A COOL DRY PLACE.

Other Precautions:DO NOT GET IN EYES, ON SKIN OR CLOTHING. DO NOT BREATHE VAPORS OR MIST. DO NOT TAKE INTERNALLY OR TASTE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED SUITABLE RESPIRATOR WHERE EXPOSURE LIMITS ARE EXCEEDED.

Ventilation:MECHANICAL LOCAL EXHAUST VENTILATION AT POINT OF CONTAMINANT RELEASE.

Protective Gloves:IMPERVIOUS GLOVES.

Eye Protection:CHEMICAL WORKERS GOGGLES

Other Protective Equipment:WEAR PROTECTIVE EQUIPMENT TO PREVENT EXPOSURE & PERSONAL CONTACT.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING, & BEFORE EATING, DRINKING OR SMOKING.

Supplemental Safety and Health NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:N1

Solubility in Water:SLIGHT

Appearance and Odor:GREEN PASTE

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

AVOID CONTACT WITH STRONG OXIDIZING AGENTS, MINERAL ACIDS & EPOXY RESINS UNDER UNCONTROLLED CONDITIONS.

Stability Condition to Avoid:EXCESSIVE HEAT.

Hazardous Decomposition Products:CO, CO2, NOX.

===== Disposal Considerations =====

Waste Disposal Methods:PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL LAWS.

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GTA MARINE OUTSIDE PLANT (OSP) CABLE RACEWAYS
PITI CABLE RACEWAY LANDING PROJECT

LOT 252

Municipality of Piti, Guam

ENVIRONMENTAL PROTECTION PLAN

June 2016

PREPARED FOR:

CALIFORNIA PACIFIC TECHNICAL SERVICES (CALPAC), LLC
(CONTRACTOR)
150 East Harmon Industrial Park Road
Tamuning, Guam 96913

PREPARED BY:

DUENAS-CAMACHO & ASSOCIATES, Inc.
238 E. Marine Corps Drive
Suite 201 Diamond Plaza Building
Hagatna, Guam 96



EXPIRATION 4/30/2017
THIS WORK WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION

ENVIRONMENTAL PROTECTION PLAN

FOR

GTA MARINE OUTSIDE PLANT (OSP) CABLE RACEWAY PITI CABLE RACEWAY LANDING PROJECT

PURPOSE

The objective of this Environmental Protection Plan (EPP) is to establish an operational procedure for the construction of the proposed GTA Marine Outside Plant (OSP) Cable Raceway and Beach Manhole, which will assure compliance with laws and regulations of the Federal Environmental Protection Agency and the Guam Environmental Protection Agency (Guam EPA).

I. PROJECT INFORMATION

A. Project Location:

The project is located in the municipality of Piti, specifically near Santos Memorial Park and Tepungan Beach. The Beach Manhole and portion of the Cable Raceway will be situated in Lot No. 262. The remainder of the cable raceway will be located on the reef flat of the Tepungan Beach.

B. Project Description:

This project is the construction of a Beach Manhole and Marine Cable Raceway primarily for use in communication. The design drawings defined the works as “Land Side” and “Ocean Side”. The “Land Side” work is intended for the construction of a Beach Manhole and the Ocean side work is the Marine Cable Raceway from beach manhole up to the termination point (bulkhead). A typical marine raceway is comprised of six (6) each, 4-inch diameter ductile iron pipe conduits with concrete bulkhead at the end most portion.

C. Site and Drainage Features:

Only work on the “Land Side” portion will generate drainage run off. Any run off from this portion of work which may cause erosion and contain sediments, will be controlled by silt fences, which will be placed around the work area.

II. CONSTRUCTION PROCEDURES:

A. Means & Methods of Construction

- Install silt fences, with sufficient height, on both sides of the defined work

area. If necessary, multiple rows of silt fences will be installed to prevent silt from escaping the work area.

- Reinforcing bars at 5 feet apart will be used to support silt fence and sand bags to hold down the base onto reef bottom.
- Extra precautions will be taken when working near the end of the Marine Cable Raceway. There is a cluster of “soft coral” located near the northwest end of the proposed route. If necessary, additional silt fences will be installed to provide added protection of the said soft coral cluster.
- Install floating oil boom around excavation equipment when working in the water.
- Excavate trench using rock breakers, excavators, and other support equipment. Efforts will be made to break out larger pieces for re-use as backfill for the upper portion of the excavation.
- Two (2) methods are being considered to accomplish the required work. First, during low tides (i.e., water is less than 0.5 feet deep), rubber-tired excavation equipment may be sitting on the reef flat. Second, when water depth exceeds 0.5 feet deep, tracked equipment will be loaded onto a 15’x15’ raised mobile platforms. These mobile platforms are equipped with a 3” wide x 15’ long metal pipe at the bottom that serves as a rail. If work area surfaces are irregular, cribbing will be provided underneath these platforms to make them level.
- The mobile platforms will be equipped with watertight containment walls of sufficient size to contain the maximum amount of hydraulic oils, fuels or any other fluids in the excavation equipments.
- A spoil bin mounted on rubber-tired mobile platforms will be used to hold the excavated materials. This bin will be pulled to the shore and emptied periodically when full. This is to minimize the number of equipment trips over the reef flat.
- Work hours will be between 6 A.M. to 6 P.M. daily including weekends, if necessary, if tides and weather conditions permits.
- Place Bulkhead formwork and pour concrete through tremmie pipe to form the Bulkhead as required in the drawings. Depending on the condition, the bulkhead formwork may be made from precast concrete sections or panels so removal after pouring concrete will not be necessary.
- Concrete materials to be delivered in skips placed on the mobile platforms and towed into position. The skips will be picked up by the excavator and emptied

into the chute and deposited in the tremmie pipe.

- Conduit pipes will be provided with “washed” coarse aggregate cushion around them (Top, Bottom, and Sides). The remaining or upper portion of the excavation will be backfilled with the same materials removed from the excavation at the site.
- Backfill materials will be loaded into bins on a mobile platform and towed to the work area. The excavator will be utilized to extract these backfill materials and deposit them into trench.
- Oversize and excess material removed from excavation will be disposed offsite to an approved landfill disposal area.
- On normal weather conditions, equipments that are on mobile platforms will remain in the work area even during non-working hours. When a typhoon or unusual bad weather condition is expected, these equipments will be brought to the shore.
- Fueling of excavation equipment will be done with portable fuel containers on the work platform (which is outfitted with watertight containment) in a manner to avoid potential spillage. Only appropriate and approved fuel containers and dispensing devices will be used. Any excess fuels will be brought back to shore. No fuel storage will be allowed in the work area.
- All excavated materials will be transported to the shore and stockpiled in an upland area with considerable distance from the high water mark and water bodies. These excavated materials, if contaminated with mud and soils, will be screened, washed, and re-used for backfilling.
- Excavated material washing area will be provided with adequate silt fences or earth berm to prevent wash water from directly mixing with the ocean water. The wash water is expected to percolate through the ground.

B. Excavation and Equipment Data

- Volume of Excavator Bucket: 1 Cubic Yard
- Excavator Reach Limit: 30 ft.
- Fuel type: Diesel Fuel
- Hydraulic oil type: Biodegradable oil
- Total estimated volume of material to be excavated on the reef flat is approximately 160 cubic yards.

III. ENVIRONMENTAL PROTECTION PLAN

A. Temporary Erosion and Sedimentation Control Measures

The EPP drawing constitutes the Erosion Control Plan for this project. The Guam Soil Erosion and Sedimentation Control Manual published by the Guam Environmental Protection Agency in 1986 and subsequent Amendment, is hereby adopted as a reference specification for the implementation of erosion and sedimentation control measures on this project.

The following measures and procedures as derived from Guam EPA Manual will be employed during construction to control erosion and prevent the occurrence of drainage and sedimentation problems.

B. Land Side Portion

1. Site grading and excavation will be accomplished only during suitable weather conditions. Site grading operations will be undertaken during periods of expected low rainfall.
2. Silt screen fence(s) will be placed on low points or toe/top of embankments as shown in the EPP Drawings to prevent sediment from exiting the project site or work area.
3. Should erosion of exposed haul roads is observed, mulching or placement of leafy vegetation such as palm fronds or other acceptable methods to arrest the erosion process.
4. Diversion ditches and/or dikes will be provided as required to divert sheet flow runoff from critical areas.
5. Any vegetated area disturbed by the contractor shall be sodded or seeded and mulched with vegetative cover appropriate for the soil type immediately following completion of work. The EPP drawing constitutes the Erosion Control Plan for this project. The Guam Soil Erosion and Sedimentation Control Manual published by the Guam Environmental Protection Agency in 1986 and subsequent Amendment, is hereby adopted as a reference specification for the implementation of erosion and sedimentation control measures on this project.

C. Ocean Side Portion

1. Water Quality Monitoring

The construction activities have the potential to impact receiving waters of Tepungan Channel and Piti Bay. The Contractor shall take care in the

protection of these water resources and avoid impacts to these areas, which are considered Essential Fish Habitat (EFH). Protection measures will include the installation of sediment control devices, the periodic inspection and maintenance of these devices, the curtailment of work during adverse weather and tidal/flow conditions, and visual or mechanical monitoring of water quality parameters to confirm the effectiveness of these BMPs.

Prior to start of construction, three (3) surface water samples will be collected by the Contractor's water quality monitoring personnel on the reef flat during high tide (+1.5 feet above Mean Lower Low Water). Sampling locations will be starting of ocean side, midway, and end of cable raceway. Water samples collected will be analyzed for "turbidity", "suspended solids", and "pH". These results will be considered as "ambient condition data" and will be used as reference for subsequent sampling during construction. The collected samples will be analyzed for the above parameters in accordance with methods described in the latest edition of Standard Method for the Examination of Water and Wastewater.

At the initial stage of the construction, three (3) surface water samples will be collected by Duenas-Camacho & Associates, Inc. personnel from the reef flat, during high tides, while trenching activities are in progress. Sampling locations will be (1) trench area, (2) 50 to 100 feet one side of the silt fence (down current or downwind), and (3) 50 to 100 feet on one side of the silt fence (up current or upwind). Collected samples will be placed on 1-gallon plastic containers and will be stored in a cooler with ice and taken to the selected laboratory within 2 hours of collection. The collected samples will be analyzed for parameters mentioned above and results should not exceed the limits specified in the Guam Water Quality Standards for M-2 waters. If these limitations are exceeded, the trenching works must immediately cease and improvements to the silt fences will be made. Following the improvements, another round of sampling will be conducted until satisfactory results are attained.

The report, using format recommended by Guam EPA, will be transmitted to the Guam Department of Agriculture, Guam Environmental Protection Agency, Bureau of Planning, and U.S. Army Corp of Engineers offices.

All project-related materials and equipment placed in the water shall be free of pollutants. Washing and decontamination of equipment and tools shall take place off-site to the maximum extent practicable. This is a control measure intended to prevent the inadvertent introduction of non-native invasive species from the job site into other areas. If washing is determined to be necessary, a designated bermed wash area shall be used to contain all wash water and prevent its contact with marine or surface water bodies.

D. Air Pollution

Particulate (dust) and exhaust gases (hydrocarbons and carbon monoxide) will be

the primary sources of degradation of air quality during construction. The Contractor shall be required to keep construction activities under surveillance, management and control, to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the Contractor shall be in accordance with Public Health standards and Federal Emission and Performance Laws and Standards. Ambient Air Quality standards set by the Guam EPA shall be maintained for all construction operations and activities.

Particulates: Dust particles, aerosols and gaseous by-products from all construction activities, including land clearing and grubbing, shall be controlled at all times including weekends, holidays, and hours when work is not in progress. The Contractor shall be required to keep dust down at all times by wetting, or treatment with dust suppressors, of the soil at the site, haul roads, and other areas disturbed by operations.

Smoke: There shall be no burning of cleared vegetation, solid or liquid wastes at the site during construction. After construction there shall be no incineration of wastes.

Motor Vehicle Emissions: All emissions from motorized machinery shall be controlled to be within Federal and Guam EPA limits at all times. No gasoline-powered vehicle or machine shall be operated which emits visible smoke. No diesel powered vehicle or machine shall be operated which emits visible smoke for a period of more than five consecutive seconds. All machinery shall be kept in good repair.

E. Solid Waste

Solid waste consists of rubbish, soils, debris, tree and plant material, and other discarded soil material resulting from land clearing and grubbing activities. All vegetative debris shall be disposed on-site within the limits of this construction phase. The material shall be placed such that it will not pose a hazard to personnel. No debris shall be allowed to encroach beyond the property boundaries or beyond the limits of the present construction phase within the property. The burning of solid waste is not permitted.

F. Sanitary Waste

Sanitary wastes consist of domestic sanitary sewage and garbage such as refuse and scraps resulting from the preparation and consumption of food. Garbage material will be stored in closed containers that cannot be opened by stray animals. Garbage generated at the project site will be transported to the Layon Landfill on a regular basis.

The Contractor shall be required to provide portable, temporary toilet facilities in sufficient numbers to accommodate all construction personnel until such a time as permanent facilities are available. These portable toilets shall be a type approved

by Guam EPA. They shall be secluded from public observation, emptied periodically in a manner acceptable to GWA, and maintained at all times without nuisance. Upon completion of the work, they shall be removed from the premises.

G. Pest Control

The Contractor is required to discourage the breeding or attraction of pests on the job site. There shall be no open containers of stagnant water, which will act as a breeding area for mosquitoes. Food or other organic matter shall not be left in the open to attract flies, rats or stray animals.

H. Petroleum Products

These materials shall primarily consist of the diesel oil, gasoline, hydraulic fluid, lubricating oil, and grease, which are used by machinery during construction. The Contractor shall not allow any petroleum products to enter, by any means, the near shore or ground waters.

The Contractor shall use the following guidelines to insure that there is no pollution caused by petroleum products:

Gasoline: There shall be no fixed storage of large quantities of gasoline. If a tanker truck is used, fueling of machinery shall be done in a safe manner. Containers shall be covered at all times and smoking precautions shall be strictly followed.

Hydraulic fluid, diesel, lubricating oil, and grease: Any storage of these substances shall be in an approved storage container. The storage area shall be lined with an impervious membrane and surrounded by a barrier or wall of sufficient height to insure that any spillage will be contained. Any accidental spillage shall be immediately cleaned up. This storage area shall be secured by a chain link fence or other suitable deterrent.

Oily Wastes: Oily wastes include used motor oil, gear oil, and hydraulic fluid. All oily wastes shall be stored in sealed 55-gallon steel drums away from the shoreline and in a secured area. Drums of used oil shall be disposed of at a licensed facility in accordance with the standards of Guam EPA. Oil-soaked sand, oily rags, oil filters, etc. shall be stored in sealed containers and disposed of promptly.

Maintenance and lubrication: Shop areas shall be on a plastic-lined impervious surface. Any machinery soaking in any solvent/petroleum product shall not be left unattended or uncovered. Any paints, solvents, etc., shall be stored in covered containers. All drums and containers must be properly labeled. Empty or partially full or damaged drums shall be removed from the site promptly.

I. Hazardous Waste

It is unlikely that large quantities of hazardous wastes will be generated during construction of this project. Small quantities of battery electrolytes, paints, and other similar hazards shall be disposed of off-site in a manner consistent with Guam EPA regulations.

Oil and hazardous material spills, which may be large enough to violate federal and/or local regulations, will be handled and cleaned-up in accordance with prevailing standards established by government regulations.

J. Public Safety

Signs that read "Construction Area - Keep Out" will be placed near the work area to warn people of the construction activities.

K. Motorized Equipment

All equipment shall be in good state of repair. Equipment shall be muffled and meet Guam EPA noise regulations. Operators shall be trained and operate equipment in a safe and lawful manner. Equipment exhaust shall meet Guam EPA air quality standards. Equipment shall not leak oil or fuel onto the ground.

L. Noise Control

Noise associated with this project will not be significantly greater than existing ambient conditions. All vehicles and equipment will be fitted with proper noise-suppression and emission control devices complying with U.S. or Local EPA Standards.

None of the required equipment for this project creates an excessive or damaging amount of noise to humans. Workers exposed to excessive noise levels must utilize the proper ear protection as specified in OSHA Regulations.

In order to minimize noise intrusions the Contractor shall limit all construction activities to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and on Saturdays from 7:00 a.m. to 5:30 p.m. If work on Sunday is required, only light construction work, which results in minimum noise intrusion, shall be done.

M. Natural Resources

Prior to start of construction, Duenas, Camacho & Associates, Inc. personnel, together with representatives from Government of Guam Agencies (Dept. of Agriculture, UOG Marine Laboratory, etc), will conduct physical inspection or survey of the area within the proposed project limits. The main purpose of the survey is to identify macro-invertebrates in the water (i.e., sea cucumbers, star fish, sea stars, etc.) and corals. These macro-invertebrates, if present within the

project limits, will be removed from the area and placed on a location selected by the survey team.

The project area is located near natural marine and aquatic habitats. The Contractor shall minimize habitat loss and degradation as much as possible.

Migratory birds may visit the project site during construction activities. These species are protected under the Migratory Bird Treaty Act (MBTA). Daily pre-construction surveys for migratory birds will be conducted by a biological monitor. If migratory birds are present, work will not begin until the migratory birds have voluntarily left the site.

At repairs sites in the vicinity of marine waters, daily fauna monitoring will be performed for hawksbill and green sea turtles, which are listed as endangered and threatened, respectively, and any other protected marine species that may enter the construction area. If listed species are present, work will not begin until these species have voluntarily left the site. The work would be performed in compliance with National Marine Fisheries Service (NMFS) best management practices below:

1. The project manager shall designate an appropriate number of competent observers to survey the areas adjacent to the proposed action for ESA-listed marine species.
2. Surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour. Periodic additional surveys throughout the work day are strongly recommended.
3. All work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area. If ESA-listed marine species are noticed within 50 yards after work has already begun, that work may continue only if, in the best judgment of the project supervisor, that there is no way for the activity to adversely affect the animal(s). For example; divers performing surveys or underwater work would likely be permissible, whereas operation of heavy equipment is likely not.
4. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water.
5. All objects will be lowered to the bottom (or installed) in a controlled manner. This can include the use of buoyancy controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of descent.
6. In-water tethers, as well as mooring lines for vessels and marker buoys shall

be kept to the minimum lengths necessary, and shall remain deployed only as long as needed to properly accomplish the required task.

7. When piloting vessels, vessel operators shall alter course to remain at least 100 yards from whales, and at least 50 yards from other marine mammals and sea turtles.
8. Reduce vessel speed to 10 knots or less when piloting vessels at or within the ranges described above from marine mammals and sea turtles. Operators shall be particularly vigilant to watch for turtles at or near the surface in areas of known or suspected turtle activity, and if practicable, reduce vessel speed to 5 knots or less.
9. If despite efforts to maintain the distances and speeds described above, a marine mammal or turtle approaches the vessel, put the engine in neutral until the animal is at least 50 feet away, and then slowly move away to the prescribed distance.
10. Marine mammals and sea turtles shall not be encircled or trapped between multiple vessels or between vessels and the shore.
11. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

N. Historical and Archaeological

The site of the proposed Beach Manhole and the Cable Raceway has not undergone recent archaeological surveys. Based on review of previous archaeology and history of the area and its location, the types of prehistoric cultural materials may be encountered beneath the existing ground surface. Therefore, prior to start of construction, the Contractor must get the services of an Archeological Team to perform archaeological monitoring of the area in accordance with the proposed Research Design and Monitoring Plan, prepared by Micronesian Archaeological Research Services dated 15 March 2016 (Attachment A).

Whenever any material of apparent Archaeological or Historical significance is found during clearing, grubbing, grading, excavation, or by other means, all work in the area of the find will cease. Work can continue in other areas of the project site per Archaeologist's approval. The Contractor will immediately notify the Historic Resources Office, of the Historical Preservation Office (HPO) in the Guam Department of Parks and Recreation. The telephone numbers are 475-6290 or 475-6291. If such a discovery is made on a weekend, holiday or after regular working hours, the HPO will be notified as soon as possible (next working day) and work will not resume without approval of the HPO.

O. Typhoon Contingency Plan

The Contractor is responsible for assuring that unnecessary environmental damage does not occur during periods of extreme bad weather. The Contractor shall be responsible for the security and safety of the construction work and site when warnings of winds of gale force (34 knots or more) are issued. Satisfactory day-to-day cleanup of the jobsite in accordance with other provisions of this EPP is essential in order to be properly prepared for inclement weather conditions.

During typhoon/tropical storm condition 4 (normal conditions), the regular provisions of the EPP are essential in order to be properly prepared for inclement weather conditions. It is especially important that the jobsite be kept free of accumulations of debris and materials loosely scattered about.

When typhoon/tropical storm condition 3 (48-hour warning) is set, the Contractor shall commence all securing operations necessary for a storm, which cannot be completed within 18 hours. If the condition is set during holidays or weekends, the securing operations shall proceed regardless.

When typhoon/tropical storm condition 2 (24-hour warning) is set, the Contractor shall cease routine activities to allow maximum securing effort. Any fuel drums, paint, or other potentially dangerous materials shall be secured.

Cleanup after typhoon/tropical storms shall proceed immediately as conditions permit. Of special importance is the rapid cleanup of storm debris and material with the potential for damage to ground waters.

P. Emergency Spill Response Plan

Its purpose is to prevent or reduce the discharge of pollutants to the ocean water resulting from accidental spills of petroleum products or other contaminants from construction equipment.

The following procedures will be followed when implementing an emergency spill response and cleanup plan:

1. Key personnel will receive formal training or knowledgeable in plan execution. Additionally, all workers will have basic knowledge of spill control procedures;
2. A summary of the plan will be posted at each worksite location, identifying the spill cleanup coordinators, location of cleanup equipment, and phone numbers of regulatory agencies to be contacted in case of a spill.

3. In case of a spill, the Contractor will notify the following agencies;

	<u>Agency</u>	<u>Tel. Number(s)</u>
I.	U.S. Coast Guard	355-4910
II.	Guam EPA	300-4751/52/53
III.	Emergency	911
IV.	Piti Fire Department	472-8139

4. Containment and cleanup of spills will begin immediately following a discovery of a spill.

5. The Contractor will have absorbent pads and oil booms readily available at the worksite.

6. The Contractor will maintain an inventory of appropriate cleanup materials at the worksite and have them readily available.

7. The clean-up of accidental release of petroleum products will be the responsibility of the Contractor.

Q. Removal of Construction Structures

All temporary construction structures shall be removed, and all temporary facilities such as roadways, etc. shall be obliterated, and shaped to original condition, or to such condition as specified by the contract specification.

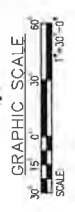
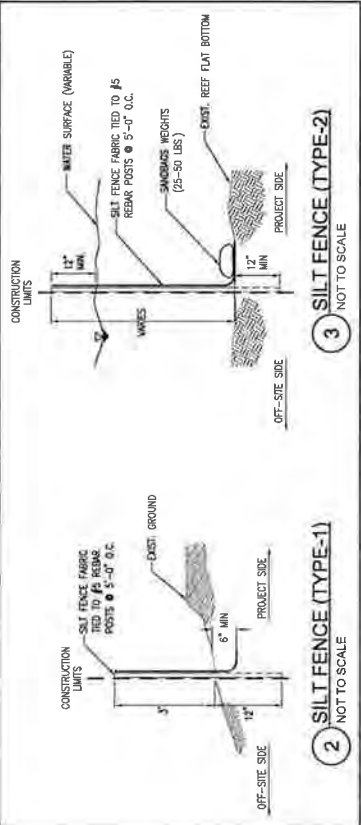
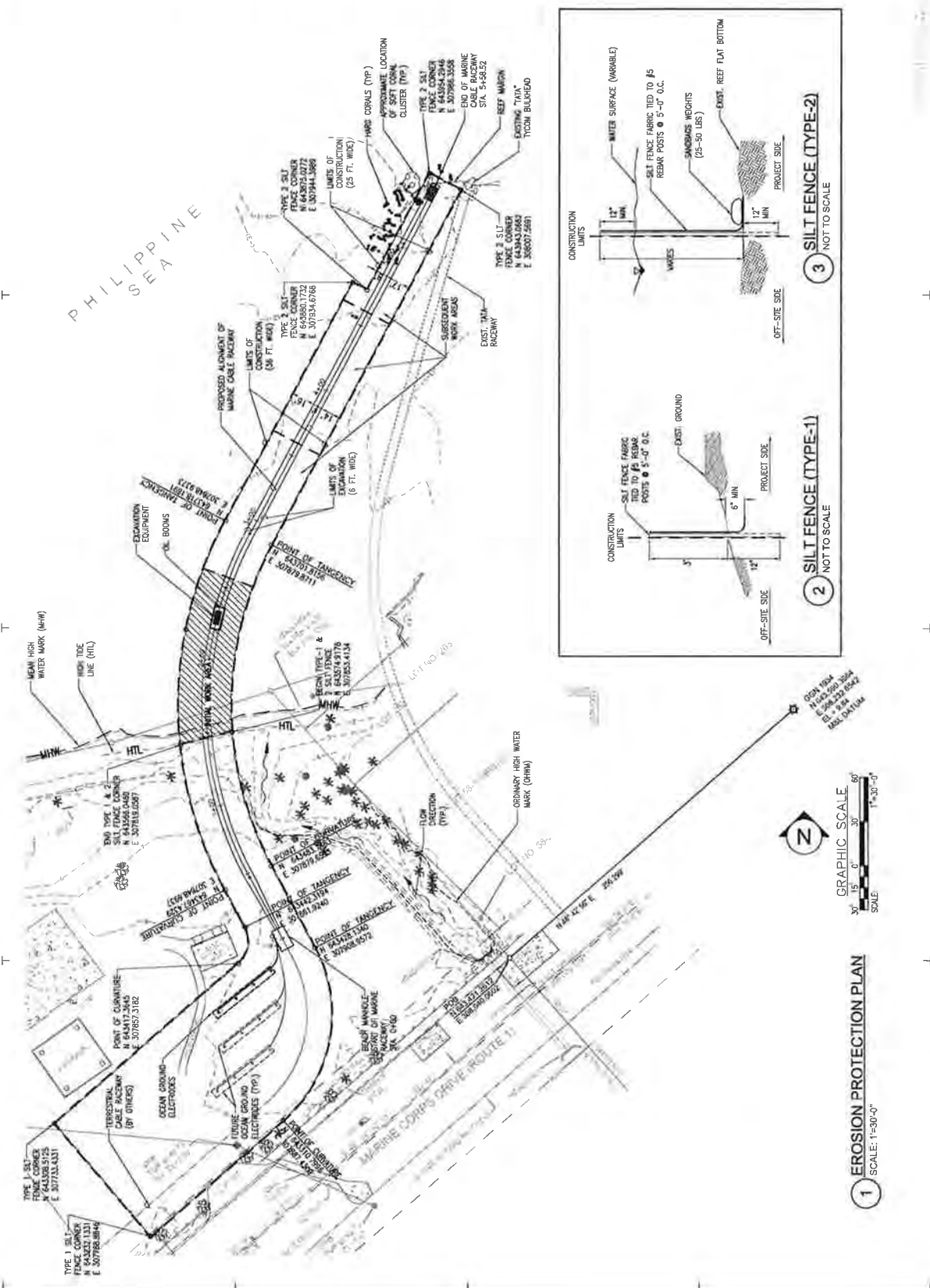
R. Traffic Control

Any work undertaken that may disturb the normal operations of traffic on Marine Drive (Route 1) shall be closely coordinated with the Department of Public Works and Guam Police Department to ensure smooth and safe driving conditions.

S. Attachments

EPP-1----- EPP Drawing
Attachment A----- Archaeological Monitoring Plan by Micronesian
Archaeological Research Services dated 15 March 2016

DATE: 05/27/2016 PROJECT: GTA MARINE OUTSIDE PLANT (OSP) CABLE RACEWAY - FTI GUAN	
EROSION PROTECTION PLAN	
(PERMIT SET)	42/095
DWS	65/095
DWS	AS SHOWN
08/31/2016	
C-4	



1 EROSION PROTECTION PLAN
SCALE: 1"=30'-0"

ATTACHMENT “A”

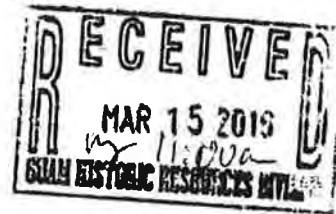
ARCHAEOLOGICAL MONITORING PLAN

Micronesian Archaeological Research Services



March 15, 2016

Mr. John Mark Joseph, Archaeologist
Guam Historic Resources Division
Dept. of Parks and Recreation
490 Chalan Palasyo
Agana Heights, Guam 96910



RE: Guam Telephone Authority's (GTA) Proposed Cable Landing Project in Piti, Guam, Lots 262 and 5NEW-1 Block 2.

Dear Mr. Joseph,

On behalf of our client, Duenas, Camacho, and Associates, Inc. (DCA), Micronesian Archaeological Research Services (MARS) submits the attached **Archaeological Monitoring, Identification, Evaluation, and Data Recovery Plan** for GTA's proposed Cable Landing Project in Piti, Guam for your review and approval.

If you have any questions, please let us know.

Sincerely,

Darlene Moore, Archaeologist

CC:Duenas, Camacho and Associates, Inc.

ARCHAEOLOGICAL MONITORING, IDENTIFICATION,
EVALUATION, AND DATA RECOVERY PLAN
FOR THE GUAM TELEPHONE AUTHORITY
CABLE SYSTEM
LOT 262 AND LOT 5NEW-1 BLOCK 2
PITI, GUAM

Prepared by
Darlene R. Moore
Micronesia Archaeological Research Services, Inc.

Prepared for
Duenas, Camacho and Associates, Inc.

March 15, 2016

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Introduction

Duenas, Camacho and Associates, Inc. (DCA) contracted Micronesian Archaeological Research Services, Inc. (MARS) to provide archaeological services for the Guam Telephone Authority (GTA) Cable System, involving conduit installation and the Southeast Asia-United States (SEA-US) cable landing at Pedro M. Santos Memorial Park (Lot 262) in Piti, Guam (Figs. 1-4). The area of potential effect (APE) includes an offshore and beach-side landing site, a trench across the Park and across (or under) Marine Corps Drive (Route 1). South of Marine Corps Drive, the cable trench will connect the landed cable to the improved GTA Substation (Lot 5NEW-1 Block 2). The locations for the subsurface disturbances related to the Cable System and connecting trenches are shown in Figure 4. The cable trench dimensions are approximately 1,110 ft long, 6 ft wide and approximately 3 ft to 5 ft deep. The proposed trench measures approximately 380 ft long and 3 ft deep offshore from mean high water to a new bulkhead at the Tepungan Channel margin, and approximately 180 ft long and 3ft deep from the mean high water to a new beach manhole. The proposed trench measures approximately 550 ft from the beach manhole to a new cable vault at the GTA Substation on the opposite side of Marine Corps Drive. The marine cable will terminate at a new beach manhole measuring approximately 15 ft long by 9 ft wide and 9 ft deep. Three ocean ground electrode beds will be installed to ground the cables. Each bed is 5.5 ft wide, 55 ft long, and 15 ft deep, and the beds are spaced 10 ft apart. The APE is 36 ft wide to encompass the new 6-foot wide cable trench, and widens in the vicinity of the beach manhole and ocean ground electrodes, and staging area (southwest of the electrodes). The marine cable will transition to a land cable at the beach manhole. Conduits to convey the land cable will be installed from the beach manhole to a new intermediate manhole that will be installed in the Park directly across from the GTA Substation. Conduits will be installed from the intermediate manhole to the Substation, and terminate at a new cable vault outside the Substation. The excavation will be 4 to 5 ft deep as it crosses Route 1 (Marine Corps Drive). The cable vault will have the same dimensions as the beach manhole (15 ft. long by 9 ft. wide by 9 ft. deep).

The proposed project includes the following parts:

Part 1 is the cable trench and conduit installation offshore from Santos Memorial Park.

Part 2 is the connecting cable trench and conduit installation onshore in Santos Memorial Park, and across Marine Corps Drive to the GTA Substation on Lot 5NEW-1 Block 2, south of Marine Corps Drive. This includes installation of a beach manhole and ocean ground beds.

Part 3 is the beach cable landing at Santos Memorial Park through the installed conduits.

Project Background

Archaeological investigations related to the proposed improvements to the GTA Substation (Lot 5NEW-1 Block 2, Piti) were completed for RIM Architects in June, 2015 by the archaeological consulting firm SEARCH. Prior to implementing a subsurface testing program on the GTA property, SEARCH submitted to Guam Historic Resources Division (GHRD) a comprehensive Research Design that includes an extensive review of the historic and archaeological history of the Piti vicinity (DeFant 2015). Because the GTA Research Design also pertains to the cable

landing and connecting trenches, the detailed historical information contained in that document will not be repeated here.

Once GHRD approved the SEARCH Research Design, the archaeologists supervised the excavation of six backhoe trenches situated within the proposed footprint for the new building on the GTA Substation property (DeFant and Leon Guerrero 2015) (Fig. 5). Significant cultural deposits were not identified in the trenches, which were dug to depths of 1.4 m below ground surface. Exposed soils consisted of coral gravel fill over loamy clay and sand containing cinder blocks, metal cables, rebar, miscellaneous metal pieces, PVC pipe filled with concrete, aluminum soda cans, plastic bottle, plastic bucket lid and a section of a wooden pole.

In 2012 Garcia and Associates (GANDA) monitored the excavation of four backhoe excavations in Piti for GTA (Craft 2012). Trenches 1 and 2 were located in the right-of-way on the inland side of Marine Corps Drive just southwest of its junction with Route 11 (Cabras Island Rd.). Trenches 3 and 4 were located in the right-of-way on the inland side of Marine Corps Drive just south of the Route 11 junction. The depth of the trenches varied from .65 to 1.60 m. All four trenches exposed layers of construction fill and/or disturbed soils. No significant cultural deposits were identified.

MARS completed an archaeological testing program at Santos Memorial Park for Duenas Camacho and Associates, Inc. in 2009 (Moore and Amesbury 2009). Twelve backhoe trenches were excavated. No significant historic properties were identified. Five of the trenches dug during this testing project were located on the east side of the Park, in or near the path of the proposed cable landing and trenching (Fig. 6). These five trenches ranged in length from 3.0 to 5.5 m, width from .75 to 1.0 m, and depth from 1.20 to 2.0 m. Generally, the five trenches exposed limestone fill over moist, sandy clay. Thickness of the fill ranged from .65 to 1.20 m. In BT 4, the clay layer beneath the fill was very moist and contained abundant decaying plant parts which suggests that portions of the Park formerly were a low lying area that supported water tolerant plants, such as mangroves. In BT 5, closest to the shoreline, the water table was reached at a depth of 1.75 m.

Other archaeological projects completed in the vicinity of the project area also encountered introduced fill material overlying disturbed clays (see details below). The subsurface soils in the vicinity of the project area suggest that portions of the area were wet, probably prone to flooding, and possibly provided a habitat for mangroves, and or gardens. On the other hand, cultural deposits and features dating to the Latte Period and the Spanish Period have been identified at the east end of Piti, near the place name Tepungan (Workman and Haun 1992).

The Area of Potential Effect (APE) for the proposed Cable System project does not encompass any historic resources listed on either the Guam Register (GRHP) or the National Register of Historic Places (NRHP). In processing the Department of the Army Permit application, the US Army Corps would engage in National Historic Preservation Act (NHPA) Section 7 consultation. This Archaeological Monitoring, Identification, Evaluation, and Data Recovery Plan would support the Corps' anticipated finding of "No Adverse Effect" for the Cable Landing project. Guam Historic Resources Division (GHRD) is anticipated to concur with that finding once an

approved **Archaeological Monitoring, Identification, Evaluation, and Data Recovery Plan** is in place. GHRD requires that the Plan address the entire project.

Based on MARS' conversations with GHRD former employee and archaeologist, Rich Olmo, prior to his departure from GHRD and considering that an extensive background review prepared by SEARCH for the Piti vicinity was previously approved by GHRD, the Plan for the Cable Landing project will describe the archaeological investigations (including archaeological monitoring, analysis, and reporting) that will occur during and after construction of the proposed project.

Because the privately funded Cable Landing project requires a permit from the U.S. Army Corps of Engineers, the archaeological research for this project will comply with the Federal regulatory mandate, including the amended National Historic Preservation Act of 1966 (especially Section 106), the National Environmental Policy Act, Executive Order 11593, the Archaeological and Historic Conservation Act of 1974, the Housing and Community Development Act of 1974, and the Archaeological Resources Protection Act of 1979. The Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation will be followed during the project.

The Guam regulatory mandate for the proposed undertaking includes Public Law 20-151 and 21-104. Public Law 20-151 requires that the project area historic properties be professionally assessed in order to fulfill GHRD permitting conditions. Under Public Law 12-126 agencies, such as GTA, must conduct their undertakings so as to maximize the protection of territorial cultural resources.

Environmental Background

Young (1988) describes the soils in Santos Memorial Park and Lot 5NEW-1 Block 2 as consisting of the Urban land Ustorthents complex. Urban land consists of areas covered by buildings, roads, and parking lots. Some of these areas have a base of crushed coral and some rest directly on limestone. Areas of Urban land are impermeable to water and runoff is rapid. Ustorthents is quarried fill material. Commonly the fill is crushed coral gravel. Included in this unit are small areas of Shioya soils along the shoreline. Shioya soils are made up of water-deposited coral sands derived from the reef. Currently, the eroding edge of the shoreline at Santos Memorial Park has a vertical drop of 50-80 cm to the narrow beach, which is underwater during periods of high tide. No significant cultural material was seen on the beach.

The previous trenching on Santos Memorial Park (Moore and Amesbury 2009) and on the GTA Substation property (DeFant and Leon Guerrero 2015) found that much of the area had been previously filled. The fill material overlays moist sandy clay. No intact cultural deposits have been noted in the clay.

Previous Archaeological Background

Recent archaeological projects completed in Piti include DeFant and Leon Guerrero (2015); Moore and Amesbury (2013); Moore (2013); Craft (2012); DeFant and Moore (2012); DeFant (2011); Vernon and O'Day (2009); Moore and Steffy (2008); Hunter-Anderson (2002); and Workman and Haun (1992). The results of most of these projects are described in the Research

Design prepared for the GTA Substation project (DeFant 2015). Those included in the DeFant document are not repeated here. Those not included in the DeFant document are included here.

In 2013, MARS did archaeological testing and monitoring of the Masso River Embankment Restoration Project in Santos Memorial Park (Moore and Amesbury 2013). Six backhoe trenches were dug on the west side of the park. Three trenches were located adjacent to the south side of the river and three were located adjacent to the north side of the river. The trenches on the river's north side exposed culturally sterile layers of beach sand, while the trenches on the river's south side exposed disturbed wet clays and introduced fill. A few glass and historic ceramic fragments were recovered from the clay below the fill in Trench 3 on the south side of the river. Two historic ceramic sherds were recovered from the trenches north of the river, along with a possible hammerstone and a slingstone (which was picked up on the beach).

In 2013, MARS monitored backhoe excavations for a new electrical conduit for the renovation of the Day Buy Day grocery store (the former New J Market) located on the inland side of Marine Corps Drive in Piti, east of the project area. The 1.0 m deep trench was situated under the paved parking lot in front of the building. Below about .75 m of introduced fill was a wet sandy clay. Three pieces of coal were noted in the clay.

In 2009, GANDA completed an archaeological investigation at the 76/Circle K Guam location (former Piti Mobile Station) in Piti (Vernon and O'Day 2009). This project area is located a short distance east of the GTA Substation and southeast of Santos Memorial Park (see Fig. 3). The 3 m deep excavation for a French Drain exposed about 1.0 m of fill over a previously disturbed, saturated sandy clay. The project lacked historically significant resources. Materials encountered in the excavation included metal and PVC pipes, wire, and rough cut lumber with galvanized nails and mortise-and-tenon joints. The authors proposed that these were the remains of an old wooden structure of some sort. The GHRD office suggests that the timbers could represent a section of cord road, built to cross the wet clay in Piti (Mr. JM Joseph, Territorial Archaeologist, pers. comm. 2015).

In 2008, MARS completed a survey of *Hotmun Sanhiyong*, Guam's Outside Ovens for the Guam Historic Preservation Office (Moore and Steffy 2008). Two ovens were documented in Piti; the Fejeran Oven and the Quan Oven. Both were built by former Piti resident, Jose Cruz Fejeran. The Quan Oven is listed on Guam's Historic Property Inventory, GHPI Data Form 66-03-2276, the Fejeran Oven was too recent to be placed on the list. The Quan oven was located in the corner, west of J.C. Tuncap Street and north of J.C. Santos Street (see Fig. 3). Associated with the Quan oven was a raised barbecue grill and a separate, above ground water tank or fish pond. Recent construction on this property may have destroyed one or more of these features.

In 2001, MARS monitored the cable landing site situated on Lot 58-1-New-1-1New, Piti (Hunter-Anderson 2002:34). This landing site is situated along the Piti shoreline just east of the proposed GTA landing site (see Fig. 3). A drainage ditch separates the two sites. The beach manhole excavation measured 13 ft by 19 ft by 11 ft deep. A 15 cm thick layer of crushed coral gravel had been spread on ground surface prior to the excavation. Below the gravel to a depth of 1.0 m was a dark brown sticky clay, from 1.0 m to 1.7 m below ground surface was an orange-

brown sticky clay, from 1.7 m to 2.13 m was a dark gray/green muck, and from 2.13 m to 3.35 m was a whitish gray sand with numerous coral heads, staghorn coral and marine shells. Groundwater was observed at a depth of 2.13 m. The muck layer was thought to represent a former mangrove habitat, but due to the unstable excavation walls, no sample was taken. No intact cultural deposits were observed in the manhole or in the four feet wide, four feet deep trench that was located south of the manhole. However, the excavation for the manhole exposed some Latte Period pottery sherds, modern glass bottles and ordnance from WWII. The ordnance was turned over to the appropriate authorities.

Beginning in 1990 and intermittently continuing until 1993 MARS monitored mechanical excavations related to the reconstruction of Marine Corps Drive from Route 8 to Route 11 (Cabras Island Road) (Wells et al. 1995). No intact cultural deposits were identified in the Piti Highway corridor, located on the seaward side of the road.

Archaeological Expectations for the Project Area

Based on the findings of the previous archaeological projects completed in the vicinity of the project area, the landing and connecting trench are not expected to encounter significant historic properties in Santos Memorial Park. However, it is possible that the connecting trench will encounter buried intact cultural deposits on the seaward side of Lot 5NEW-1 Block 2, between the GTA Substation Building and Marine Corps Drive. This portion of the project area has not been previously investigated. Additionally, it is possible that remnants of the old Spanish Road through this part of Piti may be encountered in the connecting trench.

It is likely that the excavations related to the cable landing and connection trenching will encounter ordnance and discarded materials related to WWII. DeFant (2015) noted that a monitoring project in Piti in 1992 (Workman, Brown, and Haun 1992) encountered a “cache of rifle and small artillery ammunition in a buried earthen bunker...” In association were idler wheels from a tank, mess kits, and bipods for infantry rifles.” The location of this accumulation of WWII debris was given as across Route 1 from the coastal portion of the GTA Substation property, Lot 5NEW-1 Block 2.

A gleyed deposit containing decaying wood and roots may be encountered in the excavations. An analysis of this organic material could provide information about the types of vegetation that were growing in the area, prior to the clearing and infilling that has taken place.

Methods and Procedures

The purpose of the Archaeological Monitoring, Identification, Evaluation, and Data Recovery Plan is to ensure that historic resources in the project area are identified and appropriately treated prior to their being lost from the archaeological record. The plan describes the steps to be taken when assessing historic significance.

The main criteria for determining the significance of archaeological materials are the federal government’s guidelines for nomination to the National Register of Historic Places, especially Criteria A and D. Criterion A states that a site is significant if it is associated with events important to broad patterns of our prehistory or history. This would include WWII. Criterion D

states that a site is significant if it has yielded or has the potential to yield important information about the prehistoric or historic record of a place or people. This would include, for example, data pertaining to prehistoric settlement, subsistence, social organization, land use, or religion, including mortuary practices.

The report style and content guidelines spelled out in the March 18, 2014 GHRD Basic Reporting Requirement will be followed.

The construction excavations related to the landing and the trench connecting the cable to the substation will be monitored by qualified archaeologists. The objective of the monitoring is to identify and evaluate potentially significant historic resources prior to their destruction and to notify DCA and GTA upon discovery of significant properties. The archaeological monitor will carry out an appropriate level of site recordation (including plan mapping, stratigraphic profiles, written descriptions and photographs). Diagnostic/museum quality artifacts, necessary to document and evaluate identified deposits or features, will be collected. Samples will be taken. Site coordinates will be located with sub-meter accuracy and site boundaries plotted on current USGS maps. Each site will have a permanent datum point established. Guam Historic Properties Inventory data forms will be updated or completed.

If the archaeologists determine that significant remains have been identified and data recovery procedures beyond what can be accomplished during the time allotted can be performed, MARS will make recommendations regarding preservation or further treatment to DCA and GTA. Any additional archaeological work may not require preparation of a new research design, but a change work order may be necessary to cover expenses for additional data recovery, if needed.

Anticipated cultural materials include both prehistoric and historic items. Diagnostic items in disturbed soils may be collected. If intact cultural deposits are encountered the archaeologists will collect individual items and quantitative samples and place them in appropriately labeled collection bags. A field catalog will be maintained. Hand excavated soils will be screened through a 1/8 inch mesh if possible. Charred material from intact features, such as earth-ovens or hearths will be collected for radiocarbon processing. Appropriate soil samples for further study will be taken during hand excavations and/or from the walls of the trenches. All recovered materials will be taken to MARS' facility on Guam for processing and analyses.

The ceramics, artifacts, and non-human faunal remains will be analyzed on Guam. The traditional ceramics will be subjected to an attribute analysis that records information about temper content, surface treatment, rim type, wall and rim thickness. The pottery data set can be compared with pottery collections from other Guam sites to see how similar or different they are. That information may provide insight as to how the people were organized on the island. Marine shells will be sorted to the lowest possible taxon (family, genus, or species), counted and weighed. The marine shell data set can be compared with other collections from similar time periods to look at differences in shell habitats and/or collection strategies. Stone and shell tools and other artifacts will be described and photographed. The tools provide information about the range of activities that were carried out at the site.

Charred materials will be sent to off-island laboratories for radiocarbon dating. If deposits of decayed wood are encountered, samples will be taken and sent to off-island laboratories for identification. Soil samples may be submitted to off-island laboratories for pollen and phytolith analyses. The results of such specialized studies can provide information about past environmental conditions in this part of Guam. Knowledge of past environmental conditions is important for accurate archaeological interpretations, such as land utilization.

If human remains are encountered, GTA and DCA will consult with GHRD to determine the appropriate measures to be taken. If they are to be removed, the costs of recovery, analysis, and reburial will be negotiated (see Burial Treatment Plan below).

Research Questions and Approaches

Archaeological inquiry is guided by both broad and site-specific research questions arising from a review of the pertinent literature and from the archaeologist's prior field experience. A major question for all projects is **When and how was the project area utilized?** Descriptions of the archaeological features and items identified during the survey will help to answer this question.

There is a growing body of archaeological evidence for prehistoric rice on Guam, but as yet little is known about where it was grown. Rice is known to have been planted in Piti in historic times. **Was rice grown in the project area?**

What was the Masso River shoreline like before dredged reef rubble was introduced to the site? If the trenching encounters soil deposits that contain decaying roots or plant material, samples will be taken and sent off-island for identification and possible radiocarbon dating.

The road through Piti linking the historic village of Sumay with Hagatna is known to have been built during Spanish times, but little is known about road construction techniques utilized in the 1700s and 1800s. If old road beds are encountered along the trench corridor, photos and GPS coordinates will be taken, profiles will be drawn, and samples taken as appropriate.

Interpretation and Dissemination of Information

MARS will prepare draft and final reports which present the methods employed, the results of the monitoring activities, an assessment of the research questions, and recommendations regarding further work, based on the significance of the findings. Government of Guam site inventory forms will be completed or updated for sites identified in the project area. Two copies of the final technical report and an electronic versions will be submitted to GHRD. Copies of the final report will be available to DCA and GTA.

Personnel

MARS staff are familiar with Guam archaeology and are qualified to perform the inventory survey, to perform laboratory analyses of recovered cultural material, to select samples for radiocarbon dating, and to send them to off-island specialists for processing. All archaeological work and personnel will conform to the Secretary of the Interior's historic preservation standards and guidelines.

Work Schedule

MARS will work closely with DCA and the construction contractors to monitor the mechanical excavations. Laboratory work including cleaning, sorting, counting, weighing, and describing the items will be initiated once the monitoring tasks have been completed. It is expected that these studies will be completed within three months after field work is finished.

Curation and Disposition of Recovered Material

MARS will store the cultural material recovered from the project area until the various analyses have been completed and the final report accepted. Once these requirements are met, the cultural material and copies of field records, photographs, and the report will be turned over to the Guam Museum.

Burial Treatment Plan

Burials are to be treated in accordance with Executive Order 89-24 and with the GHRD's General Guidelines for Archaeological Burials as amended March 2010. The guidelines specify that when human bones are found at an archaeological site, they are to be left undisturbed if possible. This requirement sometimes results in the redesign of a project.

Data recovery in a burial area entails the systematic exposure of the human remains in their archaeological context. This is accomplished by hand excavation of burial features and associated cultural deposits. Because prehistoric burials on Guam usually are located within former residential areas, the associated cultural deposits often include hearths, earth-ovens, pits, post holes, as well as various artifacts and other culturally generated materials, especially marine shell middens.

Burials will be hand excavated using small wooden picks and small to medium brushes. After the skeletal remains have been exposed, photographs will be taken and scaled plan maps drawn. If necessary, additional plan maps will be drawn during exhumation to document the locations of previously obscured bones and artifacts. Burial register forms will be completed for each burial. Burial orientation will be determined by sighting along the long axis of the vertebral column, from the cervical vertebrae to the sacrum. Burial position will be categorized as extended, semi-flexed, flexed, and tightly flexed.

The analysis of the skeletal material will be completed on Guam by a qualified osteologist. In the laboratory, the skeletal remains will be allowed to air dry and will be cleaned with small brushes. Reconstruction of post-mortem breaks will be carried out only where readily apparent "joins" are available and where the resulting measurement is significant for comparative purposes. Such reconstruction will be accomplished using water-soluble glue. The remains will be measured in accordance with standard osteological techniques. Gender will be assessed for adults. Age at death will be estimated for each individual. Dental and skeletal remains will be examined for pathology and anomalies. Estimates of the minimum number of individuals (MNI) represented by human remains will be based on spatial and anatomical distribution of bones from burial and nonburial contexts. The results of these investigations will be compiled into a descriptive analysis of the remains and will be incorporated into the Final Technical Report that MARS prepares for the project.

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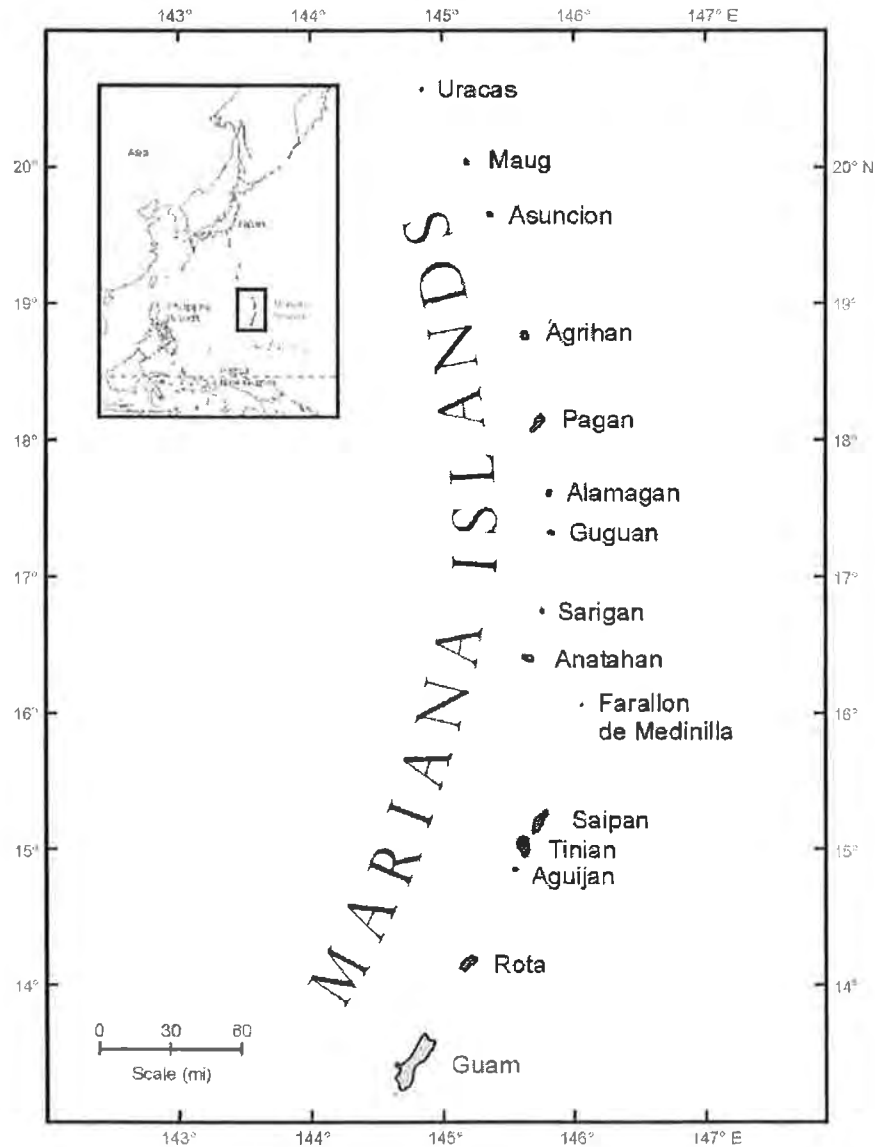


Figure 1. Map of the Mariana Islands, showing Guam. Inset shows the Mariana Islands in the Western Pacific. Courtesy of Barry Smith, University of Guam Marine Laboratory.

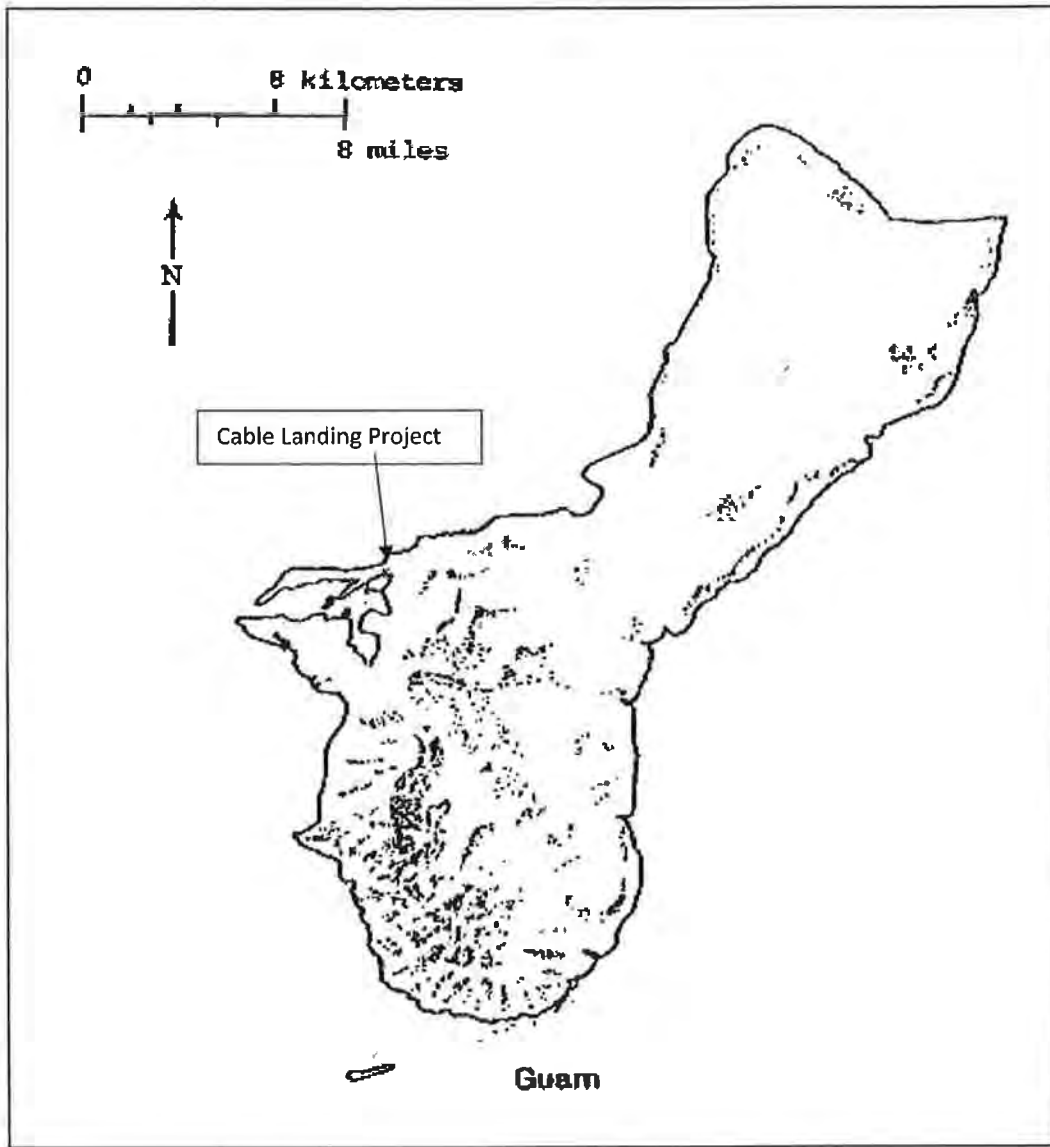


Figure 2. Map of Guam showing the location of the GTA Cable Landing project in Piti.

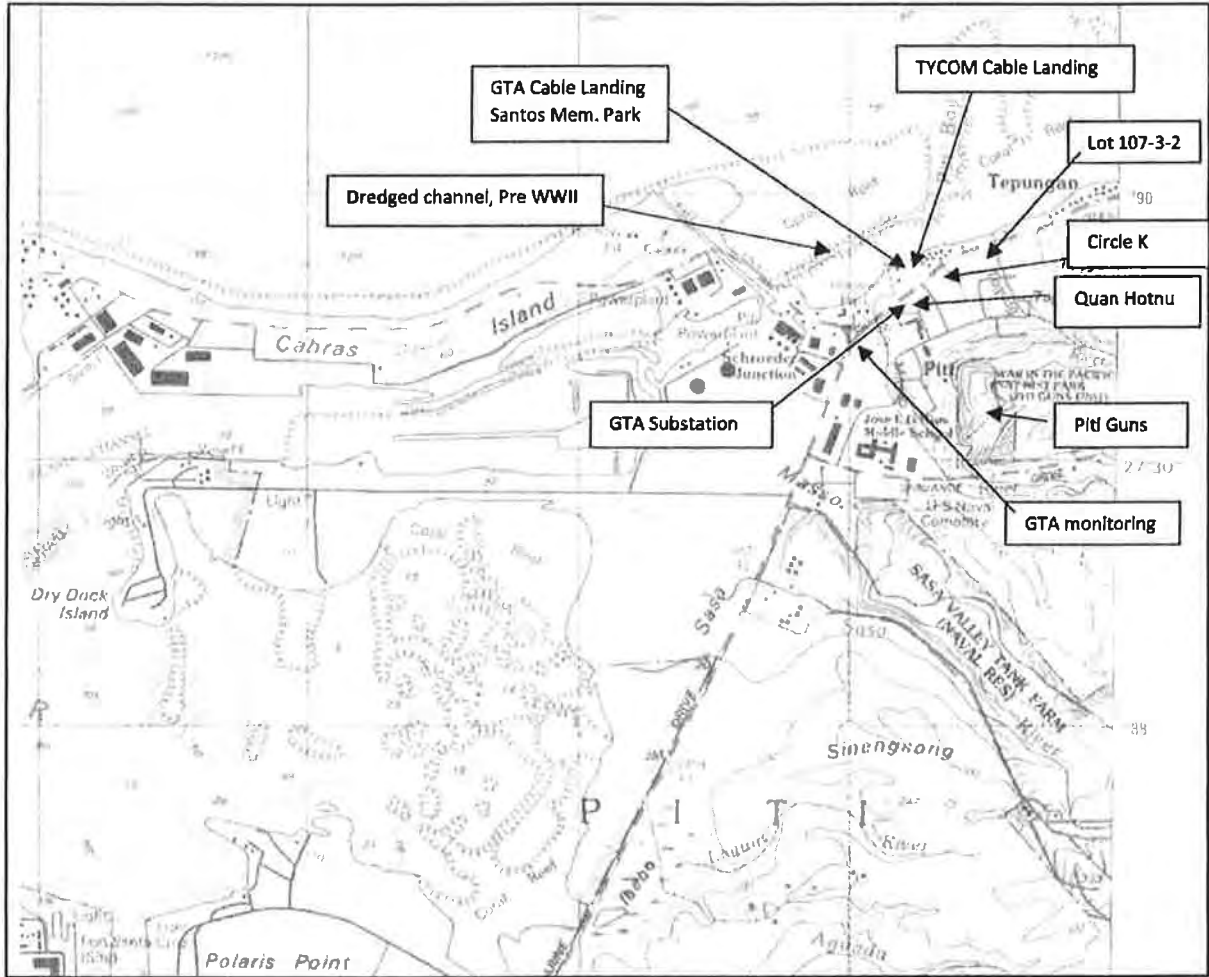


Figure 3. Section of the Apra Harbor Quadrangular Map (2000) showing the location of the GTA Cable Landing at Santos Memorial Park, the GTA Substation, and other sites or archaeological projects completed in the nearby vicinity. Historic sites on Guam’s inventory are the Quan Hotnu (66-03-2276) and the Piti Guns (66-03-1046). The other projects did not encounter significant historic properties.

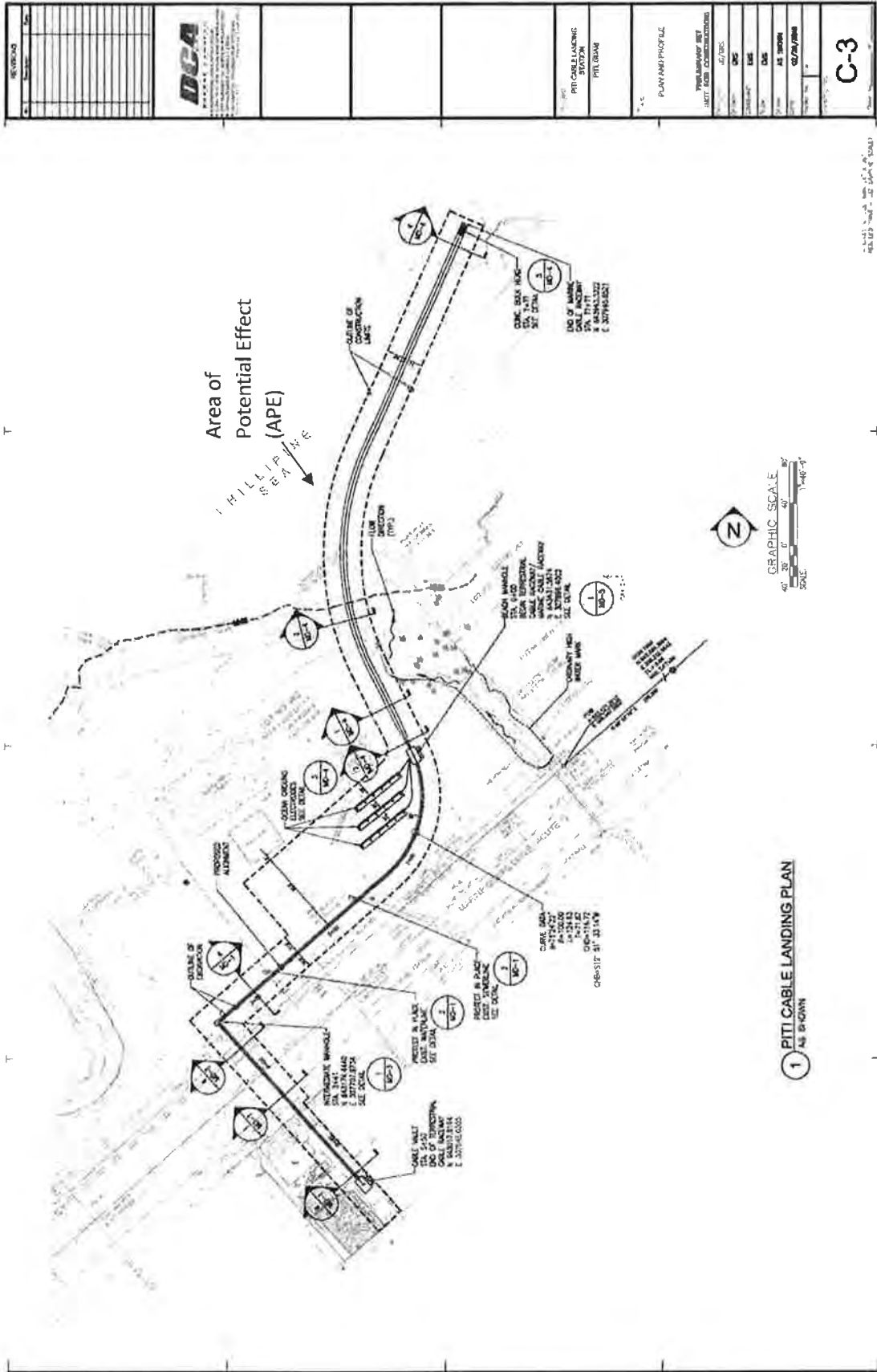


Figure 4. Plan view of the project area.

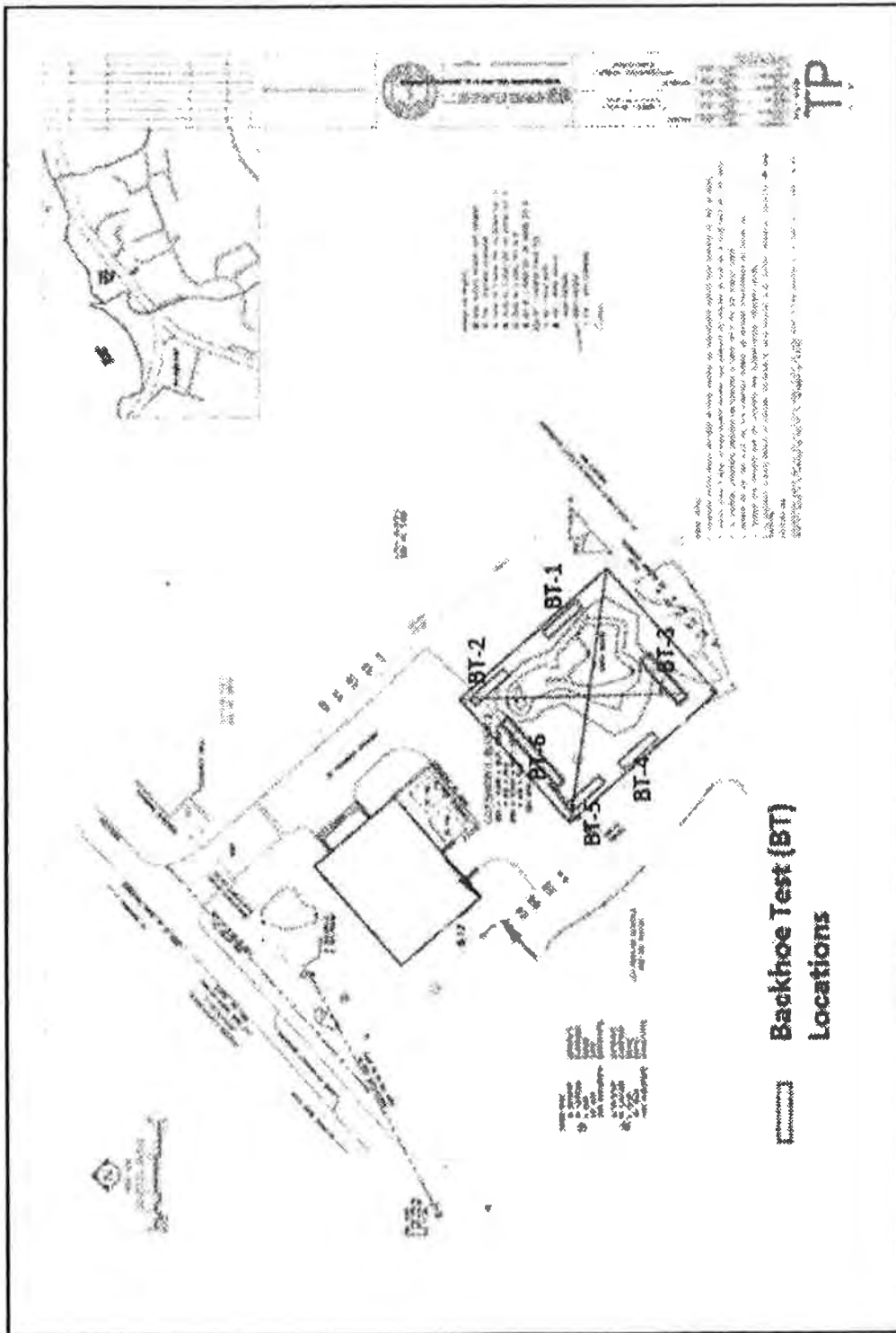


Figure 5. Plan view of the backhoe testing completed by SEARCHI in 2014 at the GTA cable station (adapted from DeFant and Leon Guerrero 2014).

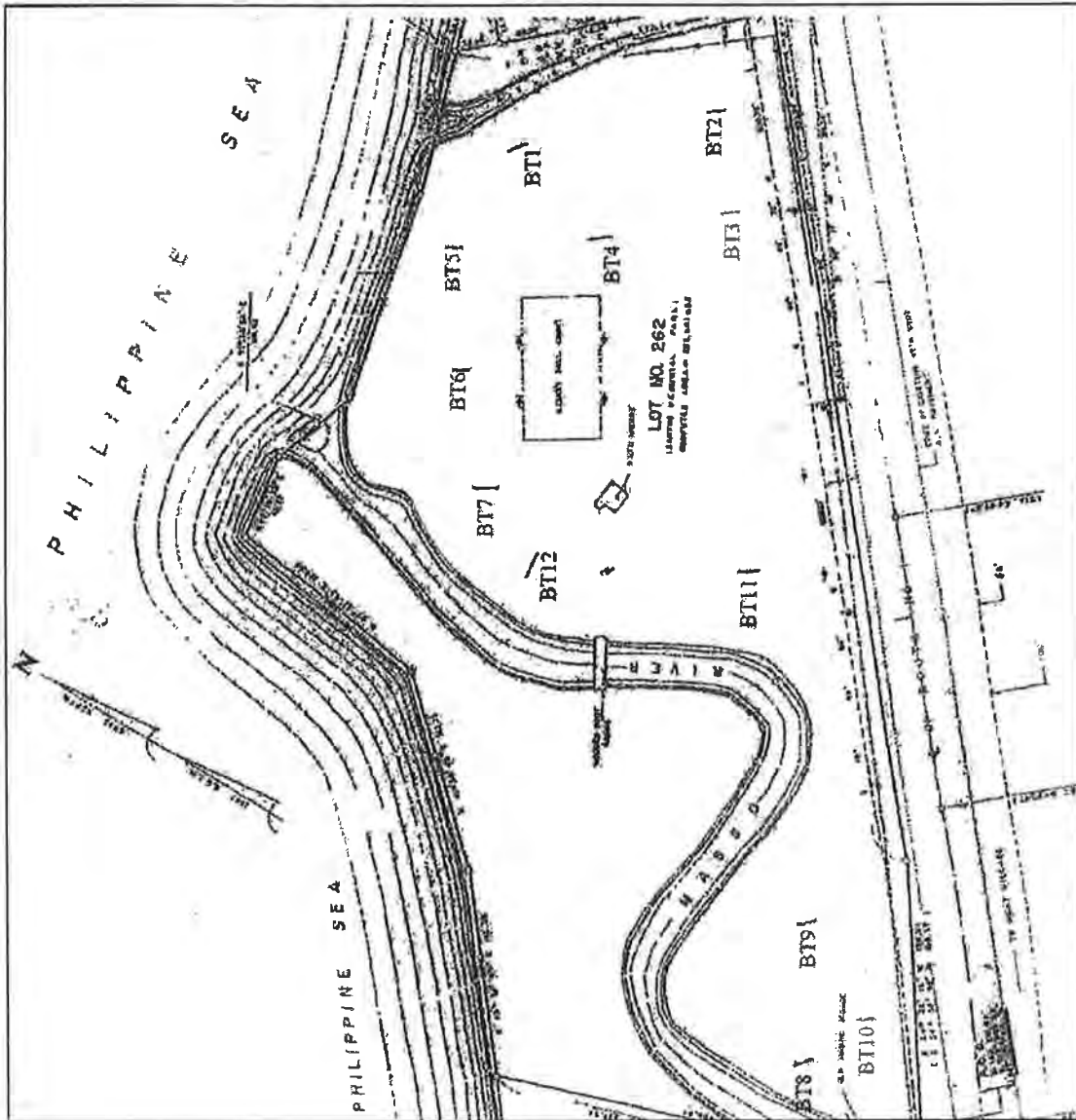


Figure 6. Plan of Santos Memorial Park showing the location of backhoe testing in 2009 (after Moore and Amesbury 2009).



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Katy R. Damico
US Army Corps of Engineers
Honolulu District
Guam Regulatory Field Office

Subject: POH-2015-00172 Conduit Installation and Landing of SEA-US Cable System, Piti, Guam.

Dear Ms. Damico:

We are providing additional information requested by the U.S. Army Corps of Engineers for the issuance of a Public Notice for a Standard Permit for the proposed activity (Application No. POH-2015-00172)].

REVISED CABLE ROUTE MAP INCLUDING CABLE PORTION OUT TO 3 NM

We have adjusted the proposed SEA-US cable routes to reduce the distance and area of hardbottom substrate crossed by the Hawaii and Philippine submerien cables. The new alignment is presented in Exhibit A, Figures 1 and 2. Figure 1 presents a map of the revised cable routes out to the three (3) nautical mile limit of the Corps' jurisdiction. The original routes are presented for comparison. Exhibit C, Updated Table 1 presents coordinates for the revised SEA-US cable route, with locations that correspond to the Exhibit A figures. Supplemental Table 1 (Exhibit C) compares the reduction in shallow hardbottom crossed by the original route (2,400 ft) and the revised route (805 ft).

ESTIMATE OF CORAL IMPACTS ASSOCIATED WITH CABLE-LAYING PORTION

The impact of the cable-laying activity would be related to the footprint of the cable crossing over hardbottom substrate containing coral reef habitat. The cable footprint varies depending on the type of cable and whether articulated pipe protection would be used over that section of cable. Three types of cable would be used within the three (3) nautical mile jurisdiction:

- double-armored (DA) cable with a 4.1 cm (1.61 inch) diameter;
- single-armored (SA) cable with a 2.8 cm (1.10 inch) diameter; and
- light-weight shielded (LWS) cable with a 2.7 cm (1.06 inch) diameter.

DA cable would be laid from shore out to the approximately 200 m (656 ft) depth. The cable type would then transition from DA cable to SA cable, and then, in the case of the Hawaii cable, transition to LWS cable just before passing the 3 nm limit. The two 4.1 cm (1.61-inch) diameter SEA-US cables (DA type cable) would be bundled near the mouth of the Piti Channel before crossing shallow hardbottom substrate in order to minimize their footprint. The bundled cables would have very little separation between them, resulting in a minimal footprint of 9 cm (3.54 inches) wide (Exhibit B).

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Articulated pipe (15.1 cm or 6.1 inch diameter) would be placed over the bundled DA cables and clamped at 20 locations onto hard substrate where there are no live corals. The clamps would be 43.6 cm (17.17 inches) long by 8 cm (3.15 inches) wide, with an area footprint of 348.8 sq cm (54.08 sq inches or 0.375 sq ft). The DA cables would be protected by articulated pipe sections from the end of the bulkhead for a seaward distance of 780 m (2,559 ft).

Exhibit C, Supplemental Tables 4a and 4b present the estimated cable footprints over hardbottom and softbottom substrates. The bundled DA cables with articulated pipe would have a disturbance footprint of approximately 0.82 ft or 9.84 inches (0.25 m) wide and would be laid over 805 ft (245 m) of shallow hardbottom substrate supporting coral reef areas with up to approximately 13% coral cover. The footprint of bundled cables with articulated pipe would occupy approximately 655.795 sq. ft., exclusive of those 20 sections where clamps would be installed. The combined total footprint of DA cables, articulated pipe, and 20 clamps would occupy approximately 663.31 sq. ft or 0.0152 acres over shallow hardbottom substrate supporting coral reef areas with up to approximately 13% coral cover. This is the estimated permanent impact area over hardbottom substrate supporting coral reef habitat from the cable-laying activity.

While corals will be avoided to the practicable extent through pre-marking the landing route, where corals are not avoidable, they would be impacted by the weight of the cable and articulated pipe placed over or adjacent to the coral colony. There would be localized damage to coral tissue by this activity; however, based on observations of other existing cables on the seabed and depending on the species involved, it is anticipated there is a good likelihood that the coral would eventually recover and grow around the cable.

UPDATED IMPACTS TABLE INCLUDING TEMPORARY VS. PERMANENT IMPACTS IN WATERS OF THE US AND CORAL REEF AREAS

- Direct but temporary impacts from cable trench.
Exhibit C, Updated Table F (Supplemental Volumes and Dimensions) presents fill dimensions for environmental protection measures installed along the cable trench portion of the project. Rebars would be hammered into the reef flat in areas of no live coral to support the silt fence, which would be anchored on the substrate by sandbags. The installation of silt fences, rebars and sandbags for the cable trenching activity would have direct but temporary impacts lasting for the duration of construction, i.e., approximately 60 days). Conspicuous marine organisms would be removed from the perimeter silt fence and placed a safe distance beyond the work zone.
- Direct and long-term temporary impacts from cable trench.
The excavation of the cable trench (3 ft deep by 6 ft wide by 404 ft long below MHW) on the reef flat would remove 223 cubic yards and 2,422 sq. ft. of material. In advance of this activity, 42 non-*Leptastrea* coral colonies would be relocated out of the construction corridor and monitored for an 18-month period. It is not feasible to relocate the tiny, encrusting *Leptastrea* corals, which would be

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directly and permanently impacted during construction. Corals outside the construction corridor would be protected from indirect and temporary effects of turbidity by establishment of silt fencing and curtains around the work zone. Conspicuous marine organisms would be relocated out of the construction corridor and carefully placed nearby on the reef flat a sufficient distance from the construction zone. This would be a direct but temporary impact on marine organisms, who are expected to recolonize the area after construction.

A total of 130.54 cubic yards of this excavated material would be replaced in the trench (over a layer of 82.17 cu. yds. of washed coarse aggregate) to restore the trench to the original elevation. The surface of the restored trench would comprise unconsolidated coral rubble and rocks (18" maximum size) from the excavation activity. While this substrate would be different from the original consolidated rock substrate, it is anticipated that corals would again colonize the site and marine organisms would return to the area after construction is completed. The excavation and fill activities for the cable trench would have direct impacts through the removal of material and replacement of unconsolidated material; however, these would be long-term temporary impacts given the eventual and natural reestablishment of corals and marine organisms over the disturbed area.

- Direct and permanent impacts from installation of bulkhead.
A concrete bulkhead will be installed at the seaward edge of the trench to keep the ductile iron conduits in place. The bulkhead will be 10 ft long by 6 ft wide by 3 ft deep and will embed five 1-inch diameter, 3 ft long steel rods for reinforcement. The disturbance area for the bulkhead and rods is 60 sf and 4.17 cubic yards for excavation followed by the same disturbance area and volume for fill activities. The concrete material will be pumped into the bulkhead formwork via a hose from shore. The direct and permanent impacts of the bulkhead installation would stem from the excavation of the coral rubble and rocks and replacement of this material with concrete. Since the bulkhead would be a consolidated hard substrate, it is possible that coral would reestablish on this structure. Corals have been observed to grow on concrete blocks over time, with relatively diverse assemblages noted, along an inactive sewer outfall in Rota (Houk and Burdick, 2016).
- Direct and permanent impacts from cable-laying portions.
As previously described, Exhibit C, Supplemental Tables 4a and 4b present the estimated cable footprints over hardbottom and softbottom substrates. The combined total footprint of bundled DA cables (Philippines and Hawaii branches), articulated pipe, and 20 clamps would occupy approximately 663.31 sq. ft or 0.0152 acres over shallow hardbottom substrate supporting coral reef areas with up to approximately 13% coral cover. This is the estimated permanent impact area over hardbottom substrate supporting coral reef habitat from the cable-laying activity.

The remaining cable-laying portions in Supplemental Tables 4a and 4b cross over deep hardbottom substrate at greater than 111 ft depth where coral cover is anticipated to be lower. The cables in these deeper areas would have smaller footprints because no articulated pipe or clamps would be used. The Hawaii cable would cross approximately 40,845 ft of deep hardbottom and would have a direct and permanent impact on approximately 5,064.78 sq. ft. The Philippines cable would cross

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approximately 16,260 ft of deep hardbottom and would have a direct and permanent impact on approximately 2016.24 sq. ft.

- Indirect and temporary impacts from cable-laying portions. Originally 10 wing clamps were proposed to prevent the cables' lateral movement; however, for further protection, now a total of 20 wing clamps will be installed over the articulated pipe in areas of hard substrate where no living coral is present. A 3 cm diameter hole for each clamp bolt will be drilled down to 30 cm with a pneumatic drill, and the bolts will be inserted and secured in place with a non-toxic marine epoxy. The sediment generated from this activity is anticipated to be very small, approximately 0.056 gallon per hole, or a total of 2.24 gallons (0.011 cu yds) for all 40 holes. There would be a direct and permanent impact to the rock substrate from the drilling activity, and an indirect and temporary impact from the release of minor amounts of sediment for each hole drilled. It is anticipated that this sediment would quickly disperse into the water column and have an insignificant effect on live corals, if any, in the vicinity.
- Direct but temporary impacts within work corridor where the trucks will be tracking back and forth. The cable trench activities will be performed within a 36-foot wide construction corridor enclosed by perimeter silt fence reinforced by rebars and sandbags, and silt curtains where appropriate. A rubber-tired rock truck and a tracked excavator would be operating within this corridor. Two temporary elevated platforms (4 ft tall) will be placed on the reef flat as a work platform for a tracked excavator fitted with a hydraulic rock breaker. The platforms will be lifted and leapfrogged by the excavator so that the excavator can move forward without much impact to the reef. The platforms will have a fully sealed containment should there be a hydraulic leak by the equipment. The platform support structures will have two 24 ft x 6 inch wide steel runners as the only contact on the reef to minimize their footprint.

The movement of the rock truck over the reef flat within the work corridor would have a direct but temporary impact on the reef flat area adjacent to the cable trench. The rock truck would have rubber tires and would be able to articulate its body so as to minimize its impact on the reef flat as it turns. Inspections of the heavy equipment for leaks would be conducted daily prior to commencing work, and spill kits would be available for immediate deployment in the event of a release.

STATEMENT ON IMPACTS TO ESA-LISTED CORAL SPECIES

There are branching corals within or adjacent to the cable-laying corridor, including one previously identified ESA-listed *Acropora globiceps* colony (Figure 2, Appendix A); however, based on marine biological and video surveys, the occurrence of branching corals is very low with colonies few and far between, and the applicant is confident that these branching corals can be avoided during the cable-laying activity. Based on marine surveys, no ESA-listed corals occur within or adjacent to the cable trench construction corridor.

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MITIGATION STATEMENT

The applicant proposes to offset the temporal loss of ecological functions associated with the proposed activity by relocating non-*Leptastrea* hard corals within and immediately adjacent to the cable trench corridor. The relocation will be followed by monitoring of the relocated corals for an 18-month period. In order to offset the permanent placement of submarine cable structures on shallow hardbottom substrate with up to approximately 13% coral reef cover, the applicant is considering contributing to coral reef restoration programs in the same watershed as the impact site.

We hope this supplemental information assists in your review of the permit application.

Respectfully,



Claudine Camacho
Environmental Services Division

Enclosures: Exhibit A Figures 1 and 2
Exhibit B Cross-Section of Bundled Cables
Exhibit C Updated and Supplemental Tables

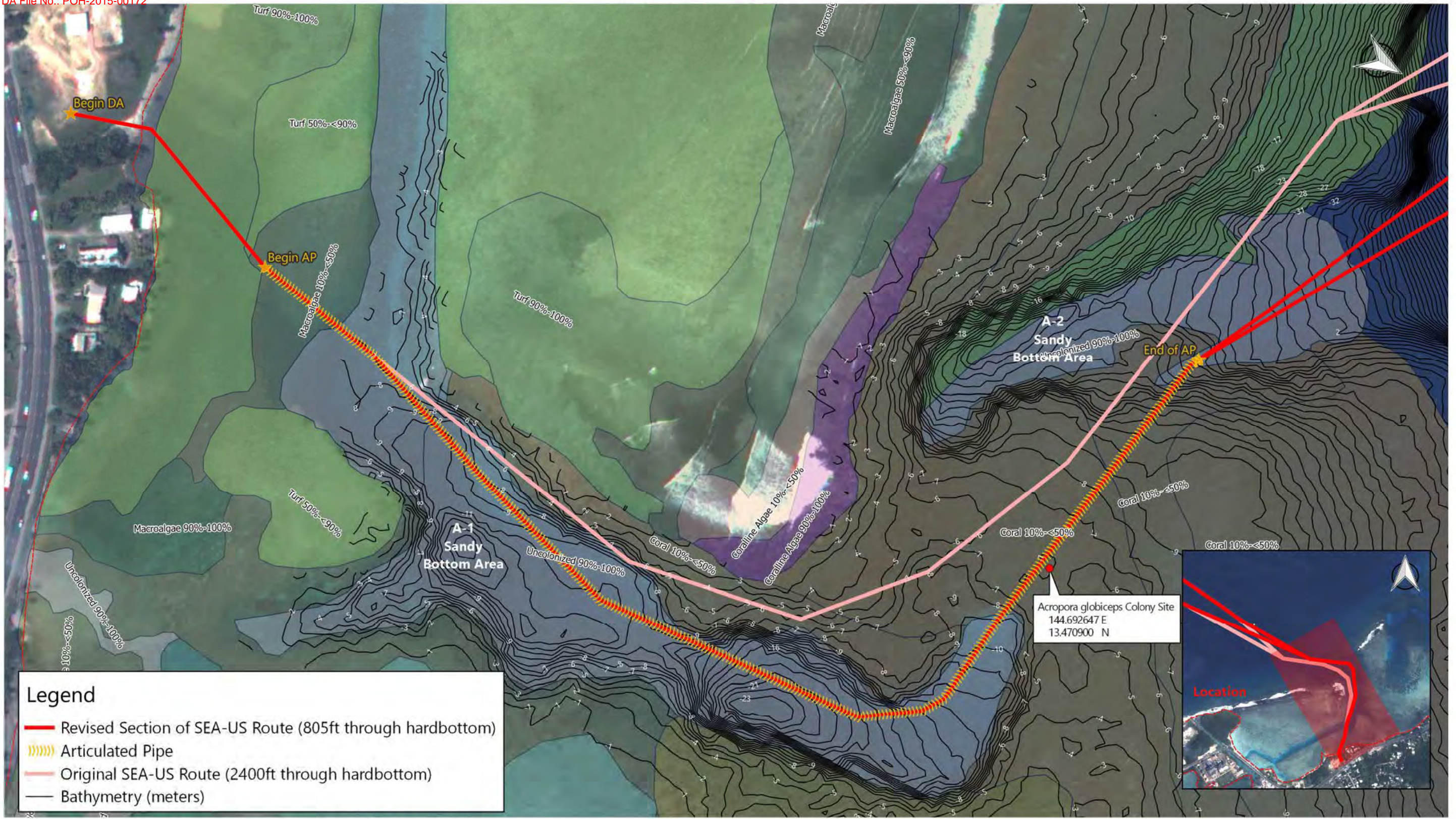
EXHIBIT A - Figure 1



New SEA-US Cable Route from Piti Landing Site Out to Three Nautical Miles

2500 0 2500 5000 ft 1000 0 1000 2000 m

EXHIBIT A - Figure 2



Acropora globiceps Colony Site
 144.692647 E
 13.470900 N

Legend

- Revised Section of SEA-US Route (805ft through hardbottom)
- ⋯ Articulated Pipe
- Original SEA-US Route (2400ft through hardbottom)
- Bathymetry (meters)

New SEA-US Route, Piti, Guam with Benthic Habitat Overlay

Benthic Habitat Data: From Pacific Islands Benthic Habitat Mapping Center in the School of Ocean and Earth Science and Technology at the University of Hawai'i at Mañoa. 5m Multibeam. 2003-2007.

2 x Double Armor Cable bundled with thin hemp cord

EXHIBIT B Cross-section of bundled cables

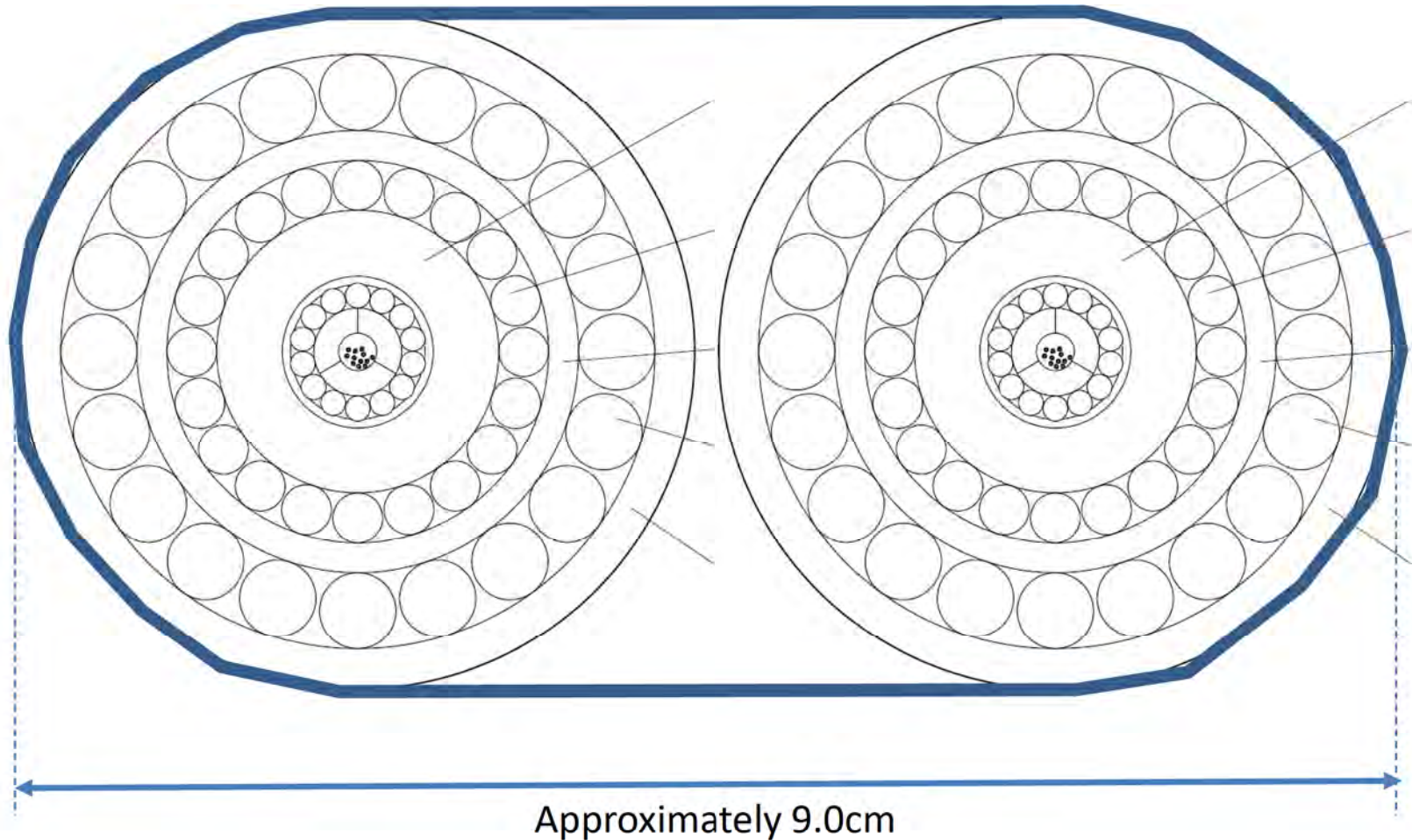


EXHIBIT C

UPDATED AND SUPPLEMENTAL TABLES

UPDATED TABLE 1. Coordinates for Revised SEA-US Route*

Location	North Longitude	East Latitude
Cable Bundling Point (9 mm diam. footprint)	144.6913	13.4710
3NM intersection Davao Cable	144.6607	13.5116
3NM intersection Hawaii Cable	144.5854	13.4809
Enter Softbottom A1 (Shoreward side)	144.6935	13.4668
Exit Softbottom A1 (Seaward side)	144.6930	13.4708
Enter Softbottom A2 (Shoreward side)	144.6913	13.4710
Exit Softbottom A2 Davao (Seaward side)	144.6903	13.4715
Exit Softbottom A2 Hawaii (Seaward side)	144.6903	13.4714

Note: A1 = Area 1 Shallow Softbottom; A2 = Area 2 Shallow Softbottom. These areas are depicted on Exhibit A, Figure 2.

*Updates Table 1 on Page 10 of Department of the Army Permit Application (Supplemental Questionnaire) for the portion below MHW and seaward of the proposed bulkhead where cable-laying activities are proposed.

UPDATED TABLE F. Supplemental Volumes and Dimensions*

Fill Below MHW from Installation of Environmental Protection Measures (Cable Trench Portion)

Wetland/Waterbody Name*	Fill Dimensions					Duration of Impact	Material
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
Piti Bay	923	0.041	4.0	3692 sq. ft.	5.61	Temporary (60 days)	Silt Fencing
Piti Bay	9.63	0.0521 (diameter)	5.0	0.3944 sq. ft.	0.0730	Temporary (60 days)	185 stakes #5 Rebar
Piti Bay	923	1.1676	0.33	1077.78 sq. ft.	13.306	Temporary (60 days)	404 Sandbags

Fill Below HTL from Installation of Environmental Protection Measures (Cable Trench Portion)

Wetland/Waterbody Name*	Fill Dimensions					Duration of Impact	Material
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
Piti Bay	940	0.041	4.0	3760 sq. ft.	5.71	Temporary (60 days)	Silt Fencing
Piti Bay	9.79	0.0521 (diameter)	5.0	0.4008 sq. ft.	0.0742	Temporary (60 days)	188 stakes #5 Rebar
Piti Bay	940	1.1676	0.33	1123.32 sq. ft.	13.8682	Temporary (60 days)	444 Sandbags

*Updates Table F on Page 4 of Department of the Army Permit Application Form.

SUPPLEMENTAL TABLE 1.
Comparison of Shallow Hardbottom and Softbottom Crossing Distances
Below MHW from Bulkhead Up to 34 m (111 ft) Water Depth
along Original and Revised SEA-US Routes

Substrate Crossed	Original SEA-US Route	Revised SEA-US Route
Shallow Hardbottom	2,400 feet = 732 meters	805 feet = 245 meters
Shallow Softbottom	740 feet = 225.6 meters	2480.18 feet = 755.96 meters
Total Shallow Crossing	3140 feet = 957 meters	3285.18 feet = 1001.32 meters

Note: Shallow crossing measured from the proposed bulkhead to the seaward extent of benthic data. Both Guam-Hawaii and Guam-Philippines cable crossing totals are combined.

SUPPLEMENTAL TABLE 2.
Comparison of Deep Hardbottom and Softbottom Crossing Distances
Below MHW from 34 m (111 ft) Water Depth to 3 nautical miles
along Original and Revised SEA-US Routes

Deep Hardbottom

Substrate Crossed	Original SEA-US Route	Revised SEA-US Route
Deep Hardbottom	58105 feet = 17710 meters	57105 feet = 17405.60 meters
Deep Softbottom	1645 feet = 501 meters	2710 feet = 826.01 meters
Total Deep Crossing	59750 feet = 18211 meters	59815 feet = 18231.61 meters

Note: Deep crossing extends from end of benthic data (approximately 34 m (111 ft) depth) to the 3 nautical mile limit. Both Guam-Hawaii and Guam-Philippines cable crossing totals are combined.

SUPPLEMENTAL TABLE 3. Cable Distances within 3 NM for New SEA-US Route

	Guam – Hawaii Cable	Guam – Philippines Cable
High Tide to 3NM	45075 feet	21406 feet
MHW to 3NM	45068 feet	21399 feet

SUPPLEMENTAL TABLE 4a. Cable Footprint Estimates From Bulkhead to 3NM

Hawaii Branch

Cable Type	Disturbance Footprint width (ft)	Length (ft)	Footprint Area (ft ²)	Shallow* Hardbottom Crossing Length (ft)	Shallow* Hardbottom Crossing Area (ft ²)	Deep* Hardbottom Crossing Length (ft)	Deep* Hardbottom Crossing Area (ft ²)	Softbottom Crossing Length (ft)	Softbottom Crossing Area (ft ²)
Double Armored (DA) inside Articulated Pipe (AP)	0.82 (bundled cable)	2553.93	2094.22	799.75	655.795	0	0	1,754.18	1,438.427
Double Armored (DA) inside Articulated Pipe (AP) with Clamp	1.431 (bundled cable)	5.25 (0.2625 clamp length x 20 clamps)	7.513	5.25	7.513	0	0	0	0
Double Armored (DA) only	0.124	2938.34	364.354	0	0	40,845	5064.78	900	156.24
Single Armored (SA)	0.092	32513.12	2991.207	0	0				
Lightweight Shielded (LWS)	0.089	6653.54	592.165	0	0				
TOTAL		44664.18 ft	6049.459 ft²	805.0 ft	663.308 ft²	40,845 ft	5064.78 ft²	2654.18 ft	1594.667 ft²

*Note: Shallow crossing measured from the proposed bulkhead to the seaward extent of benthic data. Deep crossing extends from end of benthic data (approximately 34 m (111 ft) depth) to the 3 nautical mile (NM) limit. Softbottom crossing combines shallow and deep softbottom lengths. Softbottom and deep hardbottom areas are based on the DA cable footprint, although the cable transitions to a smaller footprint for SA and LWS cable types within 3 NM.

SUPPLEMENTAL TABLE 4b. Cable Footprint Estimates From Bulkhead to 3NM

Philippine Branch

Cable Type	Disturbance Footprint width (ft)	Length (ft)	Footprint Area (ft ²)	Shallow* Hardbottom Crossing Length (ft)	Shallow* Hardbottom Crossing Area (ft ²)	Deep* Hardbottom Crossing Length (ft)	Deep* Hardbottom Crossing Area (ft ²)	Softbottom Crossing Length (ft)	Softbottom Crossing Area (ft ²)
Double Armored (DA) inside Articulated Pipe (AP)	0.82 (bundled cable)	2553.93	2094.22	799.75	655.795	0	0	1,754.18	1,438.427
Double Armored (DA) inside Articulated Pipe (AP) with Clamp	1.431 (bundled cable)	5.25 (0.2625 clamp length x 20 clamps)	7.513	5.25	7.513	0	0	0	0
Double Armored (DA) only	0.124	1279.65	260.380	0	0	16260.0	2016.24	2176.0	269.24
Single Armored (SA)	0.092	17156.35	1578.384	0	0				
Lightweight Shielded (LWS)	0.089	0	0	0	0				
TOTAL		20995.18 ft	3940.497 ft²	805.0 ft	663.308 ft²	16260.0 ft	2016.24 ft²	3930.18 ft	1707.667 ft²

*Note: Shallow crossing measured from the proposed bulkhead to the seaward extent of benthic data. Deep crossing extends from end of benthic data (approximately 34 m (111 ft) depth) to the 3 nautical mile (NM) limit. Softbottom crossing combines shallow and deep softbottom lengths. Softbottom and deep hardbottom areas are based on the DA cable footprint, although the cable transitions to a smaller footprint for SA and LWS cable types within 3 NM.