POH-2016-00095 (Hawaii Kai Marina Groin Replacement, Hawaii Kai, Honolulu, Oahu)

Fact Sheet

What's going on?

The U.S. Army Corps of Engineers Regulatory Branch (Corps) is reviewing an application from the Hawaii Kai Marina Community Association (HKMCA). HKMCA is proposing to replace the existing sandbag groin with a larger L-head rock groin located along the Hawaii Kai Marina entrance channel at 21.280739°, -157.711508° and periodically move sand trapped by the groin to the beach east to TMKs (1) 3-9-002:001, 002, 003, 004, and 034 at 21.277678°, -157.709349° all in Maunalua Bay, Honolulu, Island of Oahu, Hawaii. The purpose of replacement of the groin and sand backpassing is to maintain ingress and egress through the Hawaii Kai marina entrance channel, reduce the need for future maintenance dredging in the Hawaii Kai marina entrance channel, and reduce erosion along the east edge of Portlock Beach. The drawings at the end of this Public Notice include a photograph and simulation comparing the appearance of the existing sandbag groin and the new proposed rock groin. The Corps is conducting a public notice (i.e. asking for comments from the public) about HKMCA's proposed project as part of the Department of Army permitting review. This fact sheet was created with information provided by HKMCA to clarify information presented in the public notice.

Have a comment or question specifically about this project, but don't see it addressed on the fact sheet below? Please send an email to Vera.B.Koskelo@usace.army.mil by the end of the day on **September 11, 2018** and include this number in the email title: POH-2016-00095.

1. **What is a "groin", why is there one in this spot, and why replace it?** A "groin" is a type of structure that is installed perpendicular to a shoreline (i.e. sticking out into the ocean from the shoreline) in order to trap sand. Other names for similar structures are "jetty" or "breakwater". As sand travels in this area east to west along the shoreline, sand was filling in the Hawaii Kai Marina entrance channel, making it difficult for boats to get in or out of the marina. Although the Hawaii Kai Marina entrance channel has been dredged, dredging is expensive and can have environment impacts. The existing sandbag groin was installed to the east of the Hawaii Kai Marina entrance channel as a temporary way of reducing the need for dredging. Sandbag groins have a lifespan of about 10 years. The HKMCA is proposing to replace the sandbag groin with a rock groin, which typically has a lifespan of 50 years. In addition to replacing the sandbag groin with a rock groin in order to avoid having to replace the groin more often in the future, the proposed rock groin would also be larger and have a different shape than the sandbag groin in order to capture more sand and further reduce the need for dredging the Hawaii Kai Marina entrance channel.

2. **Limited, temporary impact to boater access to Hawaii Kai Marina**. Brief interruptions of boat traffic would be anticipated during construction. Construction materials and equipment would be ferried across the entrance channel from the staging area in Maunalua Bay Beach Park to the staging area on Portlock Beach. Flagmen and Hawaii Kai Marina patrol boats would be utilized to prevent dangerous interactions between construction barges and boats that are entering or exiting the marina.

3. **Minimal impacts to paddling clubs in Maunalua Bay.** The construction and staging areas would not be available to be used as rest stops during paddling. The canoe club buildings and practice areas in Maunalua Bay and in the Hawaii Kai Marina would not be impacted by the project. Access to Hawaii Kai Marina would be occasionally impacted by the project during construction – see item 2 above.

4. **No impacts to surf break.**
   No surfing occurs in the project area. The nearest surf spot, which is called Seconds, is well offshore and located on the east side of the entrance channel near the outermost channel markers.

5. **Minor impacts to beach recreation**. Two work and staging areas, located on Portlock Beach adjacent to the proposed groin and west of the entrance channel in Maunalua Bay Beach Park would not be available for recreational use for the duration of construction activity. The staging areas are shown on the project drawings at the end of the public notice.

6. **Limited, temporaray impacts to traffic/parking.** Construction workers would park either in a construction staging area or existing public parking facilities located at Maunalua Bay Beach Park or on Portlock Road. Mobilization and demobilization of the on-shore equipment would require large trucks moving through Hawaii Kai for a limited duration. Because of the small number of vehicle-trips involved, construction worker and equipment/material delivery trips would not have the potential to substantially affect traffic volumes and/or the level of service on area roadways and do not require substantial mitigation efforts.

7. **Approximately two months of noise impacts.** The overall duration of the project is expected to last approximately two and a half months. Noise levels would temporarily increase during the project duration due to use of equipment needed for construction. Equipment operation on the shoreline would be limited to the hours between 7:00 a.m. and 7:00 p.m. Construction vehicles and equipment would use broadband noise backup alarms instead of typical higher frequency beepers (broadband noise alarms tend to be less audible and intrusive with distance as they blend in with other background noise sources). The project would use the quietest locally available equipment when possible (e.g., high insertion loss mufflers, fully enclosed engines, and rubber tired equipment). Construction equipment would not be allowed to use horns for signaling.

8. **Limited, temporary impacts to snorkeling and fishing**. A turbidity containment barrier would surround the in-water construction activity and effectively "fence" off the work from any people in the water. Once construction staging areas are established, fishermen would not be able to use the existing temporary sandbag groin nor the proposed groin at any point during its construction. After construction equipment has been demobilized, the project area would again be open to recreational activities.

9. **Minor impacts to views from groin, but beneficial to views of the east side of Portlock Beach.** Though the proposed groin would be larger than the existing temporary sandbag groin, the proposed groin would have a minimal effect on public scenic view planes from Kalanianaole Highway, Portlock Beach, Maunalua Bay

Beach Park or offshore vessels. The proposed project would preserve the quality of coastal scenic and open space resources by maintaining a sandy beach area on the Portlock side of the groin. Shoreline open space would be improved at the southeast end of Portlock Beach by restoring eroded beaches with the proposed sand backpassing plan.

10. **Temporary short-term impacts to water quality.** The proposed replacement of the groin would create turbidity (sand/sediment in the water) during the construction period which would be contained by a turbidity curtain. The sand backpassing activity would also potentially result in turbidity and would also be contained by a turbidity curtain at both the removal site next to the groin and at the placement site in the east end of Portlock Beach.

11. **Why are you moving sand along Portlock Beach?** Sand naturally moves along the shoreline from east to west along Portlock Beach. This movement of sand is resulting in erosion along the east end of Portlock Beach, particularly at TMKs (1) 3-9-002:001, 002, 003, 004, and 034. Clean sand would be moved from the area behind (the east side of) the new groin in order to allow the groin to trap more sand and to protect the shoreline on the east side of Portlock Beach.

12. **Status of planning.** A Final Environmental Assessment (FEA) was prepared to evaluate possible alternatives, assess potential environmental impacts and define appropriate mitigation measures for the project. The FEA was accepted by the Chairperson of the DLNR on August 08, 2017. HKMCA is working with regulatory agencies to obtain permits for the project, including a Department of Army permit, Section 401 Water Quality Certification, and Coastal Zone Management Federal Consistency Determination (all currently under review).

    Want to learn more about HKMCA FEA? Read the FEA online at the Office of Environmental Quality's online EA/EIS Library at the following link: http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-08-08-OA-FEA-Hawaii-Kai-Groin-Replacement.pdf

PUBLIC NOTICE

US Army Corps of Engineers, Honolulu District

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

Public Notice Date: **August 20, 2018**
Expiration Date: September 11, 2018
Permit File Number: POH-2016-00095

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.

APPLICANT:
Mr. Robert Clark, Hawaii Kai Marina Community Association
377 Keahole Street, D1-C
Honolulu, Hawaii 96825

WATERWAY AND LOCATION OF THE PROPOSED WORK: The proposed riprap groin would be located along the Hawaii Kai Marina entrance channel and recurring sand backpassing would be conducted from behind the new groin, located at 21.280739°, -157.711508° and 21.277678°, -157.709349° respectively, all in Maunalua Bay, Honolulu, Island of Oahu, Hawaii.

PROPOSED PROJECT AND PURPOSE:
The project description is as follows, to be conducted in accordance with the project drawings (enclosed):

The proposed project is the replacement of the existing sandbag groin located along the east side of the Hawaii Kai Marina entrance channel with a larger rock rubble mound groin in the same location.

The Hawaii Kai marina entrance channel (entrance channel), located at the west end of Portlock Beach and east end of Maunalua Bay Beach Park, experiences sediment accumulation and has been dredged in 1959, 1981, 1985, 2004, and 2013. The existing 20-foot wide by 150-foot long sand bag groin constructed on the southeast side of the entrance channel was constructed in 2004 as part of a larger dredging project to reduce the rate of sediment accumulation in the entrance channel and to stabilize the adjacent shoreline. Due to degradation over time, the sandbag groin was reconstructed in 2013.

The new approximately 45-foot wide by 180-foot long rock groin with a 34-foot wide by 50-foot long L-head terminus constructed in the same location as the sandbag groin

would result in the discharge of 830 cubic yards of rock and 210 cubic yards of coralline gravel in an approximately 11,500 square foot area channelward of the Mean Higher High Water (MHHW) line, used as a proxy for the High Tide Line (HTL). The construction of a new 11-foot wide by 60-foot long rock rubble mound revetment in an approximately 1,500 square foot area in uplands above the MHHW line would tie the new groin in to the existing concrete rubble masonry abutment on the Kalanianaole Highway Bridge that crosses the entrance channel. Prior to placing fill for the permanent groin and revetment, the footprints of these structures would be excavated. Beach quality sand approved by the DLNR-OCCL would be placed adjacent to the new groin in uplands landward of the HTL outside the Corps geographic jurisdiction. Unapproved excavated material would be disposed of in the Waimanalo Gulch Sanitary Landfill or the PVT Integrated Solid Waste Management Facility.

Sand that accumulates behind the new groin would be mechanically moved by backpassing to the southeast to the east end of Portlock Beach at TMKs (1) 3-9-002:001, 002, 003, 004, and 034 where erosion is threatening the backshore and private properties. A study by the University of Hawaii Coastal Geology Group estimated an average erosion rate of approximately 1 foot of erosion annually. The sand backpassing would be initiated during construction by moving approximately 400 cubic yards of sand that has accumulated since reconstruction of the sandbag groin in 2013. Sand backpassing of the estimated approximately 1,600 cubic yards of sand trapped annually by the groin (based on estimated sediment transport rates along Portlock Beach), in comparison to the approximately 1,200 cubic yard sand trapping capacity of the sandbag groin, would recur approximately every four years or as-needed. A preliminary design shows the sand placed in an approximately 35-feet wide area, on average, along the 280-foot long sand deposition area. Sand would be deposited in an approximately 10,000 square foot area, 7,000 square feet of which would be below the MHHW. The deposited sand would increase dry beach width by an average of 7 feet, with a maximum increase of 13 feet fronting TMK (1) 3-9-002:034.

Construction of the proposed groin and revetment is estimated to take approximately three months. The 30,492-square foot area primary staging area would be located on the north side of the entrance channel on the east terminus of Maunalua Bay Beach Park, including an approximately 20-foot wide by 100-foot long temporary pier, and the approximately 3,000-square foot area secondary staging area would be located on the beach adjacent to the existing groin (fronting TMK (1) 3-9-002:031 and used for equipment storage and a limited amount of construction material. Stone for the groin and revetment would be delivered by truck via Kalanianaole Highway daily or every other day early in the morning. Large construction equipment and materials would be offloaded at the project area from the temporary pier extending from the primary staging area via a barge in the entrance channel. An excavator, located on land or on a barge for some of the work further from shore, would be the primary construction equipment used for the project. Turbidity curtains would be installed around the temporary construction access pier on the east side of the entrance channel, around the groin and revetment construction and the sand removal and sand deposition sites prior to the sand backpassing.

The proposed construction sequence would consist of preparation of the staging areas; conducting the one-time 400 cubic yard sand backpassing; removal of the existing sandbag groin while simultaneously excavating trenches for the stone toe then placing the base stone of the groin working sea-ward from the Kalanianaola Highway Bridge; adding the stone on the upper portion of the groin working landward from the L-head terminus; and demobilizing and removing construction equipment, the temporary pier, and any other construction BMPs.

Basic Project Purpose: to maintain navigation

Overall Project Purpose: to maintain ingress and egress through the Hawaii Kai marina entrance channel, reduce the need for future maintenance dredging in the Hawaii Kai marina entrance channel, and reduce erosion along the east edge of Portlock Beach

Avoidance and Minimization: Offsite alternatives were not considered because some type of structure in the footprint of the existing groin is required to address sediment that is being naturally deposited in the entrance channel. The applicant evaluated seven on-site alternatives in the 2017 Final Environmental Assessment, including the proposed project work, four other configurations of rock rubble mound groins, continuing to maintain the existing sandbag groin, and a no-action alternative. The no action alternative would not meet the project purpose. In comparison with the proposed structure, the sandbag groin and other rock rubble mound groin alternatives evaluated either had a larger footprint, would require more frequent sand backpassing, or would require more frequent replacement of the structure, all of which would result in more environmental disturbance than the proposed structure. The proposed structure is designed to minimize the project footprint while also minimizing the frequency of sand backpassing events and minimizing the need for dredging the Hawaii Kai Marina entrance channel. Best management practices, including use of a full-length turbidity curtain enclosing the project area during construction, will also be incorporated into the work to prevent construction-related turbidity from spreading beyond the project area.

Mitigation: The proposed project would overlap with approximately 615 square feet of seagrass bed. Impacts to the seagrass bed would be minimized by relocation of the seagrass to a protected location outside of the project footprint. The project permanent impacts would not be substantial; therefore the Corps is not requiring compensatory mitigation for the project.

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 will 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 will 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 will result in a discharge of dredged or fill material into a water of the U.S.** and will 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 State of Hawaii, Department of Health – Clean Water Branch.

COASTAL ZONE MANAGEMENT ACT CERTIFICATION: **The proposed activity may 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 State of Hawaii, Department of Business, Economic Development, and Tourism – Office of Planning.

HISTORIC PROPERTIES: Pursuant to Section 106 of the National Historic Preservation Act (NHPA), our assessment of the project leads us to a preliminary determination that there are no historic properties within the project area. Therefore, consultation with the State of Hawaii, Department of Land & Natural Resources, Historic Preservation Division (SHPD), Office of Hawaiian Affairs, and the applicable Native Hawaiian Organizations will be conducted independent of 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 species have the potential to occur near the project location:

Green Sea Turtle (*Chelonia mydas*), Threatened
Hawksbill Turtle (*Eretmochelys imbricata*), Endangered
Hawaiian Monk Seal, (*Monachus schauinslandi*), Endangered
Hawaiian Monk Seal, (*Monachus schauinslandi*) critical habitat

Preliminary determinations indicate that the described activity may affect an endangered or threatened species or its critical habitat. Consultation under Section 7 of the Endangered Species Act of 1973 (87 Stat. 844) will be initiated. A permit decision for the proposed activity will not be issued until the consultation process is completed.

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 will have an adverse effect on EFH. Consultation under MSA is required for the described activity. A permit decision for the proposed activity will not be issued until the consultation process is completed.

FEDERAL EVALUATION OF APPLICATION: The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The 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 will 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; Native Hawaiian Organizations; and other interested parties in order to evaluate the direct, indirect, and cumulative impacts of this proposed activity. Any comments received will 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 will 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 will be accepted and made part of

the record and will 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
Regulatory Branch, Attn: Ms. Vera Koskelo
Building 230
Fort Shafter, Hawaii 96858-5440.

Alternatively, comments may be emailed to Vera.B.Koskelo@usace.army.mil. Reference POH-2016-00095 in the subject heading of the email. In order to be accepted, e-mail comments must originate from the author's e-mail account. All e-mail comments should be sent to Vera.B.Koskelo@usace.army.mil

Both conventional mail and e-mail comments must include the DA permit number **POH-2016-00095**, and the commentor's name, address, and phone number. **All comments whether conventional mail or e-mail should be received by the close of business on September 11, 2018.**

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. Vera Koskelo via telephone at (808) 835-4310 or via email at Vera.B.Koskelo@usace.army.mil.

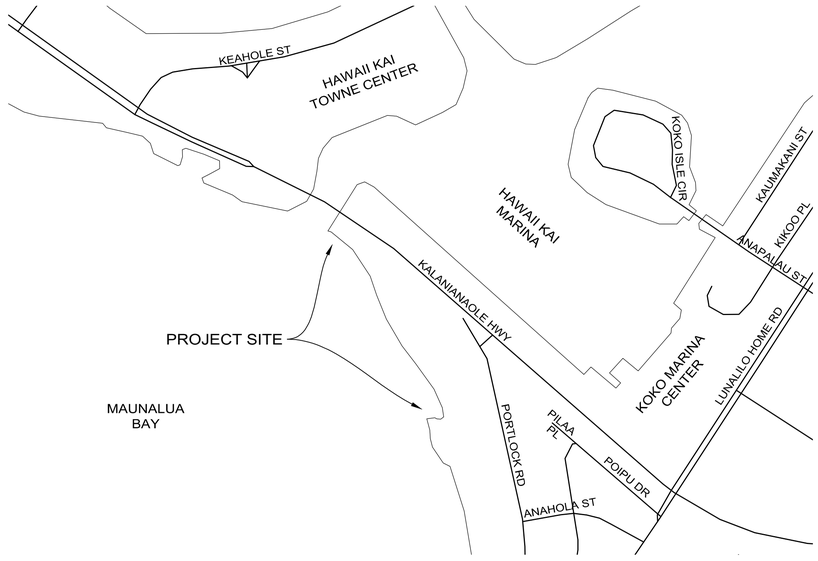
Tunis W. McElwain
Chief, Regulatory Branch

HAWAII KAI MARINA ENTRANCE CHANNEL GROIN REPLACEMENT

HONOLULU, OAHU, HAWAII

HAWAII KAI MARINA COMMUNITY ASSOCIATION

Sea Engineering, Inc.



INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	DESCRIPTION
1	T-001	TITLE SHEET
2	G-101	CONSTRUCTION ACCESS AND STAGING AREAS
3	G-102	WATER QUALITY PROTECTION PLAN
4	C-101	GROIN LAYOUT AND TYPICAL SECTIONS
5	C-102	SAND BACKPASSING PLAN AND SECTIONS

ABBREVIATIONS

', FT.	FEET	NTS	NOT TO SCALE
", IN.	INCHES	SHT(S).	SHEET(S)
CRM	CONCRETE RUBBLE MASONRY	SQ. FT.	SQUARE FEET
CY	CUBIC YARDS	STA.	STATION
DET.	DETAIL	TYP.	TYPICAL
EL.	ELEVATION		
EXIST, (E)	EXISTING		
FIN.	FINISHED		
LBS	POUNDS		
MIN.	MINIMUM		
MLLW	MEAN LOWER LOW WATER		
NOM.	NOMINAL		

30% DESIGN DRAWINGS NOT FOR CONSTRUCTION

Sea Engineering, Inc.
MAKAI RESEARCH PIER
WAIMANALO, HI 96795
808.259.7966
www.seaengineering.com

REVISION	DATE

HAWAII KAI MARINA ENTRANCE CHANNEL GROIN REPLACEMENT HONOLULU, OAHU, HAWAII

PROJECT NUMBER: 25455	
PROJECT ENGINEER: DL	
DRAWN BY: DL	
CHECKED BY: JB	
SCALE: NTS	
DATE: MARCH 15, 2017	

TITLE PAGE

DRAWING NO.:	SHEET NO.:
T-001	1 of 5

(a)

(b)

Figure 2-9. Project site looking west from Portlock Beach:
(a) existing condition, (b) with proposed 290-foot long L-head groin

(a)

(b)

Figure 2-10. Project site looking from the Kalanianaole Highway Bridge: (a) existing condition, (b) with proposed 290-foot long L-head groin

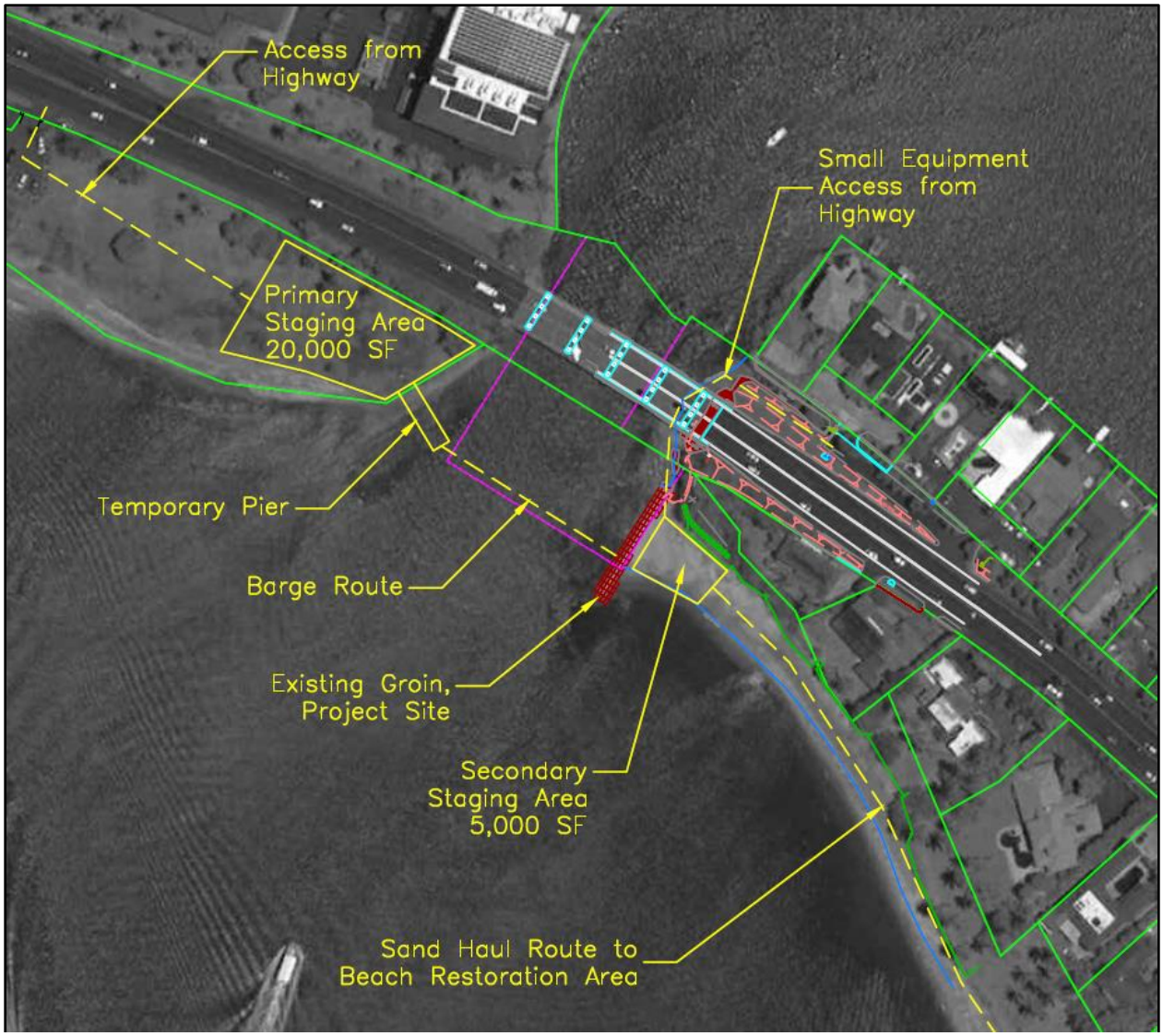
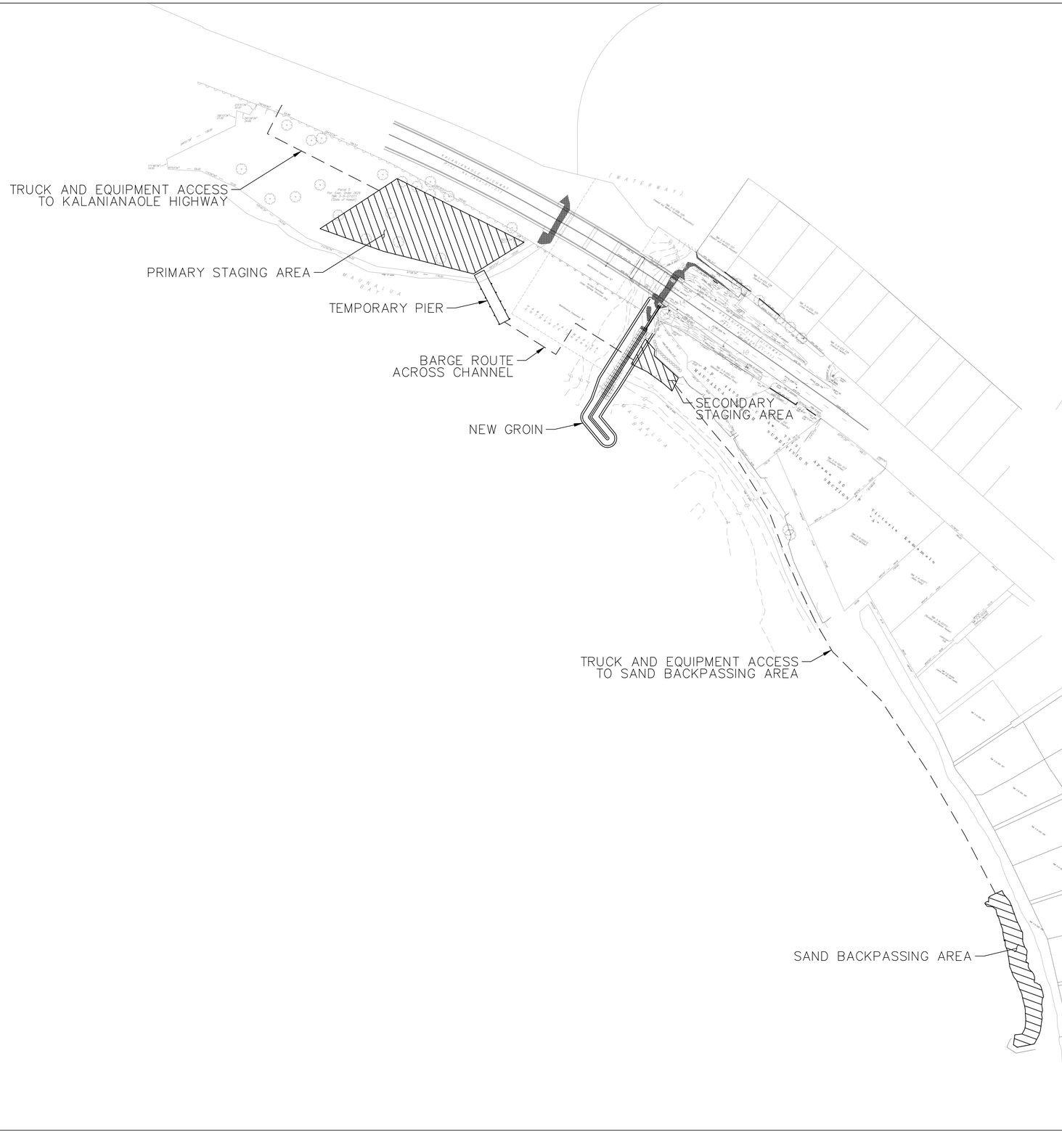


Figure 2-11. Construction access and staging areas



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FAX 808.259.8143

REVISION	DATE

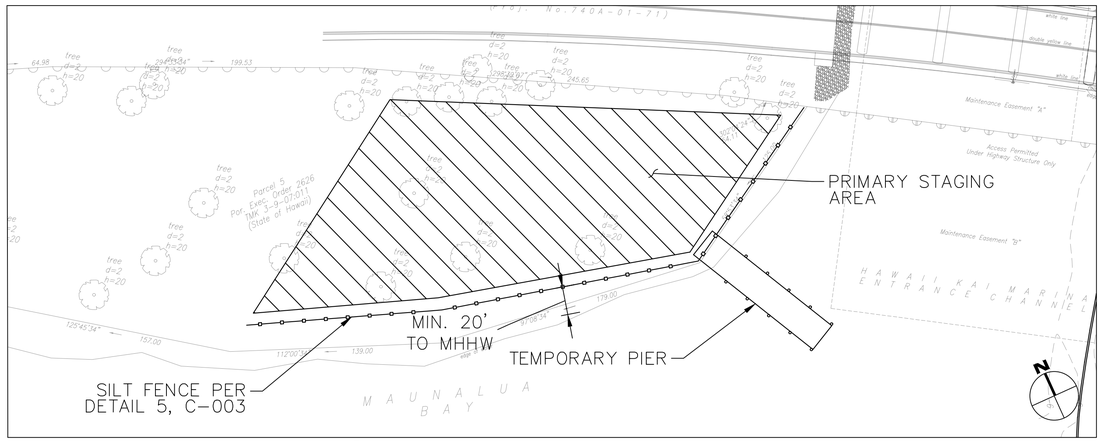
HAWAII KAI MARINA
ENTRANCE CHANNEL
GROIN REPLACEMENT
HONOLULU, OAHU, HAWAII

PROJECT NUMBER:	25455
PROJECT ENGINEER:	DL
DRAWN BY:	DL
CHECKED BY:	JB
SCALE:	NTS
DATE:	MARCH 15, 2017

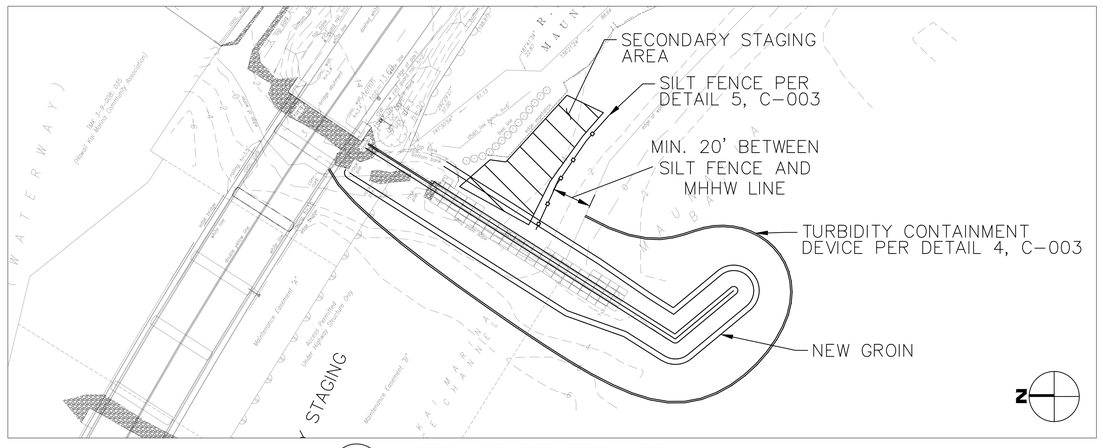
CONSTRUCTION ACCESS AND STAGING AREAS

DRAWING NO.:	SHEET NO.:
G-101	2 of 5

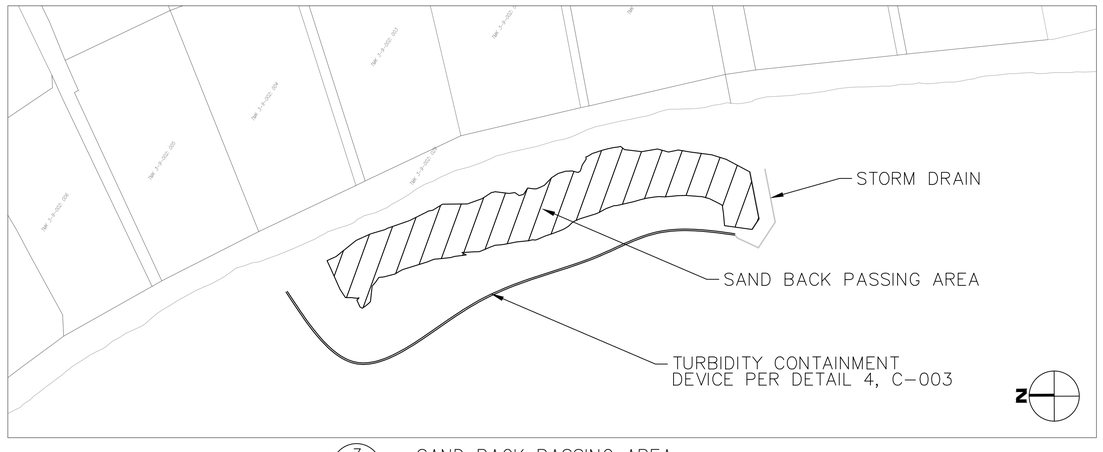
30% DESIGN DRAWINGS
NOT FOR CONSTRUCTION



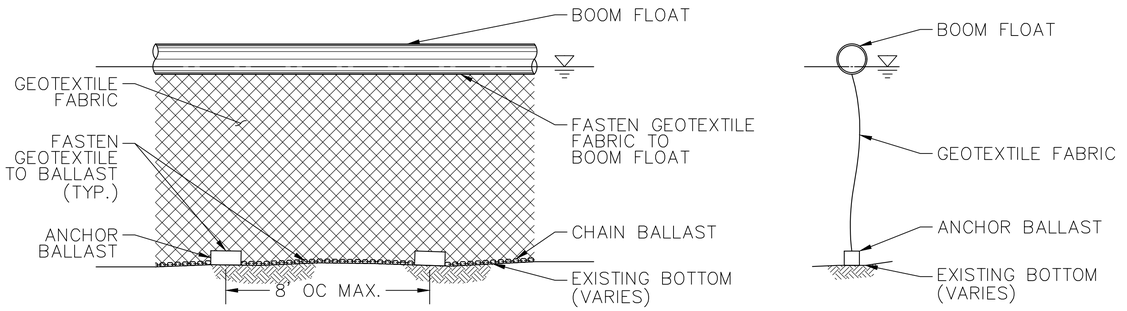
1 G-102 | G-102 WORKSITE STAGING AREA
SCALE: 1" = 50'



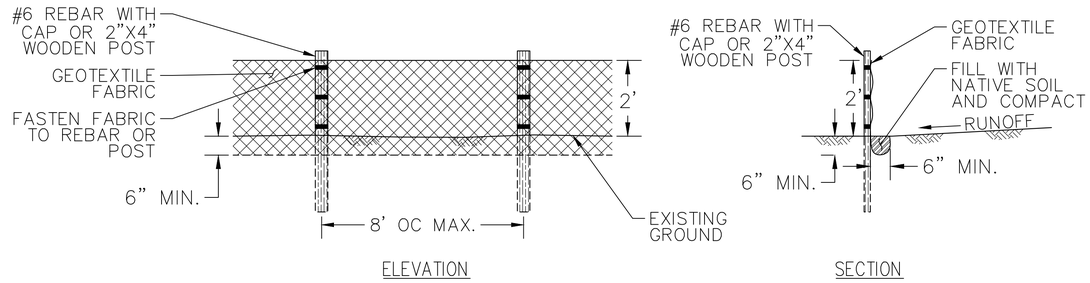
2 G-102 | G-102 GROIN CONSTRUCTION AREA
SCALE: 1" = 50'



3 G-102 | G-102 SAND BACK PASSING AREA
SCALE: 1" = 50'



4 G-102 | G-102 TURBIDITY CONTAINMENT DEVICE DETAIL
SCALE: NTS



5 G-102 | G-102 TYPICAL SILT FENCE DETAIL
SCALE: NTS

NOTES:

GENERAL

1. TURBIDITY CONTAINMENT DEVICES AND ON-LAND SILT FENCES SHALL BE OF SUFFICIENT DESIGN, STRENGTH, AND SUITABILITY FOR THEIR INTENDED APPLICATION IN THE OCEAN ENVIRONMENT.

2. SILT FENCE FILTER FABRIC SHALL BE MIRAFI SILT FENCE, AMOCO SILT STOP, OR APPROVED EQUAL.

3. FLOATING TURBIDITY CONTAINMENT DEVICES SHALL GENERALLY BE COMPOSED OF A WATER SURFACE FLOATATION BOOM WITH A MINIMUM FREEBOARD OF 4 INCHES, A SKIRT HANGING VERTICALLY TO THE REQUIRED DEPTH, BALLAST WEIGHT AT THE SKIRT BOTTOM, AND SUFFICIENT ANCHORS TO MAINTAIN THE CURTAIN IN PLACE.

4. THE FLOATING TURBIDITY CONTAINMENT DEVICE SKIRT MATERIAL SHALL BE MONOFILAMENT WOVEN POLYPROPYLENE WITH THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:

PROPERTY	VALUE	TEST METHOD
GRAB STRENGTH	200 LBS	ASTM D 4632
PUNCTURE	90 LBS	ASTM D 4833
TRAPEZOID TEAR	90 LBS	ASTM D 4533

PERVIOUS GEOTEXTILE SKIRT MATERIAL SHALL HAVE A MAXIMUM APPARENT OPENING SIZE (AOS) AND PERCENT OPEN AREA (POA) CAPABLE OF RETAINING FINE SUSPENDED SEDIMENTS 0.004 MM OR LARGER IN DIAMETER.

5. A DESCRIPTION OF THE TURBIDITY CONTAINMENT DEVICE(S), THEIR MATERIALS AND DESIGN, AND THE PROPOSED DEPLOYMENT METHODOLOGY SHALL BE INCLUDED IN THE ENVIRONMENTAL PROTECTION PLAN AND APPROVED BY THE STATE PRIOR TO THEIR USE.

6. TURBIDITY CONTAINMENT DEVICES AND FENCES SHALL BE INSPECTED DAILY, AND IMMEDIATELY REPAIRED OR REPLACED AS NECESSARY TO ENSURE THEIR EFFECTIVENESS.

GROIN CONSTRUCTION AREA (IN-WATER)

1. A TURBIDITY CONTAINMENT DEVICE SHALL BE DEPLOYED TO COMPLETELY SURROUND THE AREA OF ACTIVE IN-WATER CONSTRUCTION.

2. SHOULD WEATHER OR SEA CONDITIONS PROHIBIT PROPER PLACEMENT AND FUNCTION OF THE TURBIDITY CONTAINMENT DEVICE, CONSTRUCTION SHALL CEASE UNTIL CONDITIONS PERMIT PROPER DEPLOYMENT.

WORKSITE AND EQUIPMENT/MATERIALS STAGING AREAS (ON LAND)

1. A SILT FENCE SHALL BE INSTALLED AND MAINTAINED ALONG THE OCEAN SIDE OF THE WORKSITE AND EQUIPMENT/MATERIALS STAGING AREAS.

2. THE SILT FENCE SHALL BE LOCATED A MINIMUM OF 20 FEET LANDWARD OF THE MEAN HIGHER HIGH WATER (MHHW) LINE.

30% DESIGN DRAWINGS NOT FOR CONSTRUCTION

Sea Engineering, Inc.
MAKAI RESEARCH PIER
WAIMANALO, HI 96795
808.259.7966
FAX 808.259.8143

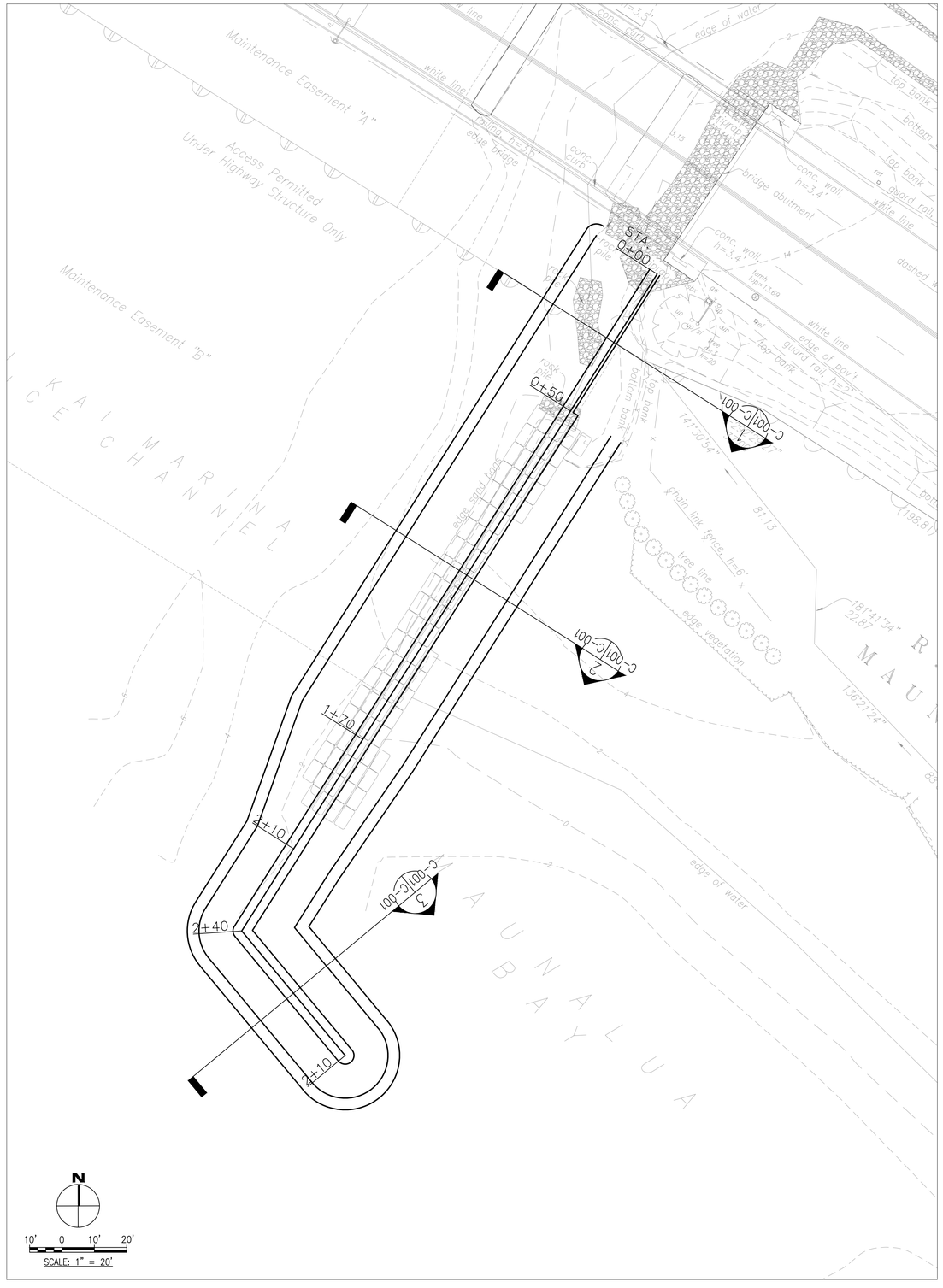
REVISION	DATE

HAWAII KAI MARINA ENTRANCE CHANNEL GROIN REPLACEMENT
HONOLULU, OAHU, HAWAII

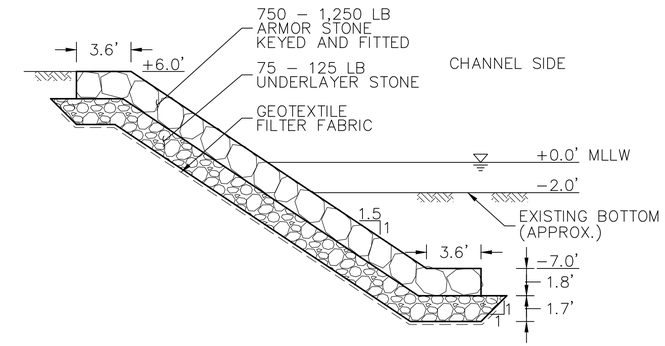
PROJECT NUMBER:	25455
PROJECT ENGINEER:	DL
DRAWN BY:	DL
CHECKED BY:	JB
SCALE:	NTS
DATE:	MARCH 15, 2017

WATER QUALITY PROTECTION PLAN

DRAWING NO.:	SHEET NO.:
G-102	3 of 5



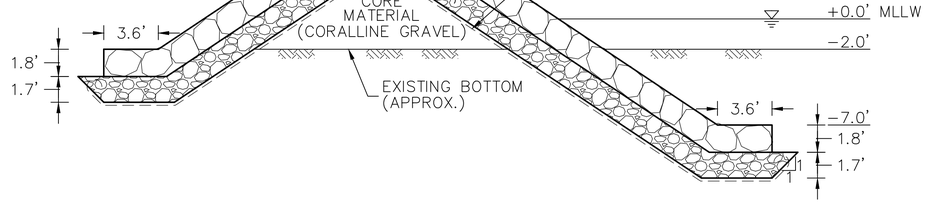
PORTLOCK SIDE



1 C-001 C-001 TYPICAL SECTION – STA. 0+00 TO STA. 0+50

SCALE: 1" = 5'

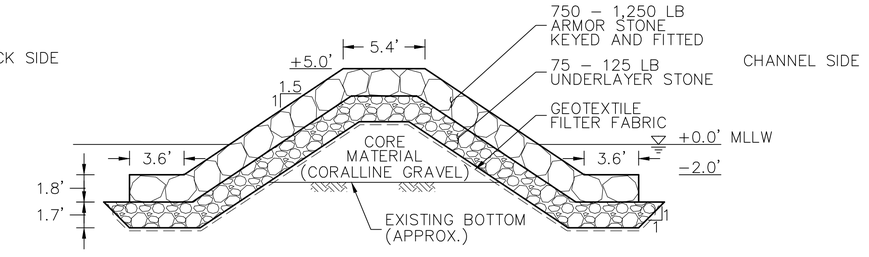
PORTLOCK SIDE



2 C-001 C-001 TYPICAL SECTION – STA. 0+50 TO STA. 1+70

SCALE: 1" = 5'

PORTLOCK SIDE



3 C-001 C-001 TYPICAL SECTION – STA. 2+10 TO STA. 2-

SCALE: 1" = 5'

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REVISION	DATE

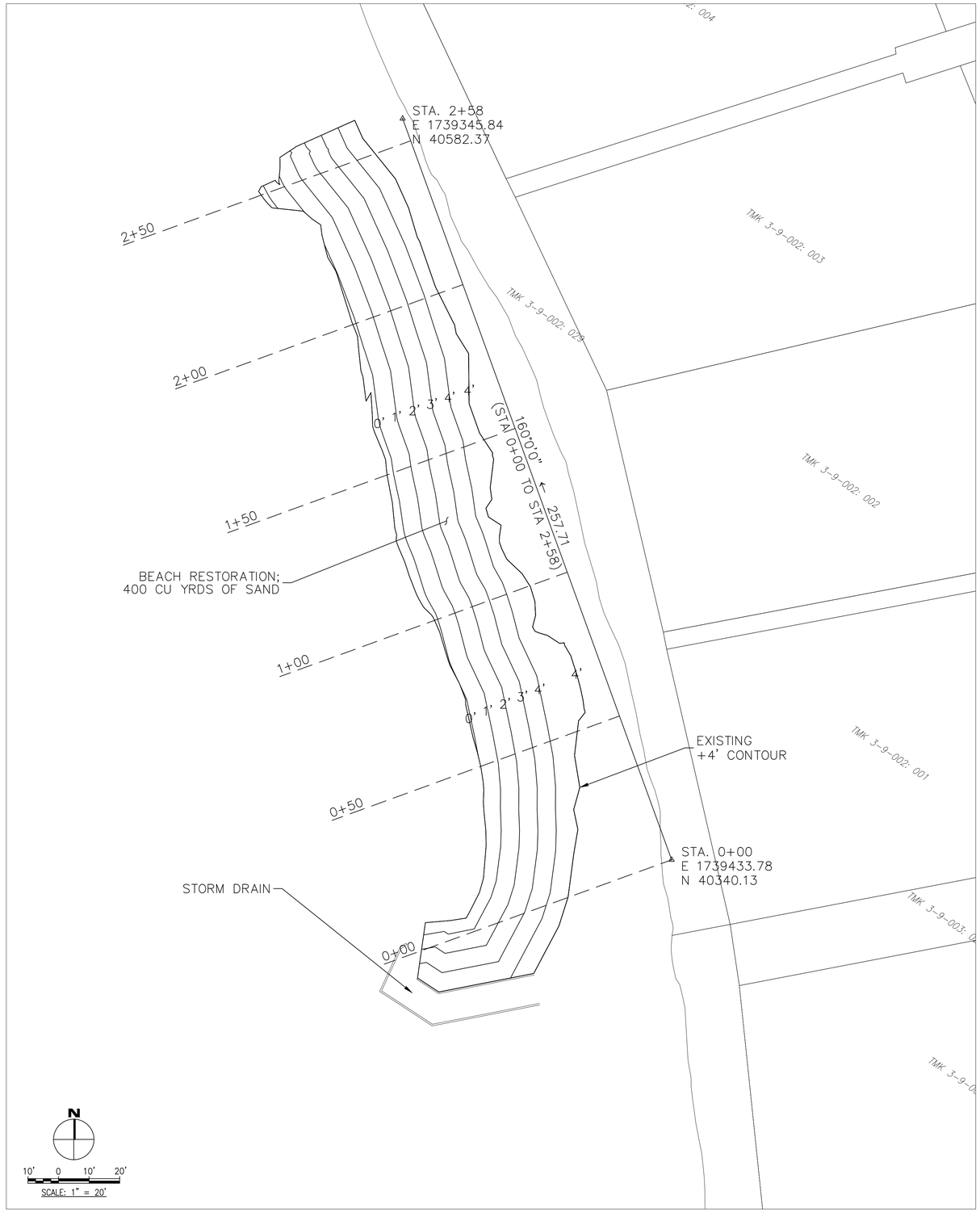
HAWAII KAI MARINA ENTRANCE CHANNEL GROIN REPLACEMENT

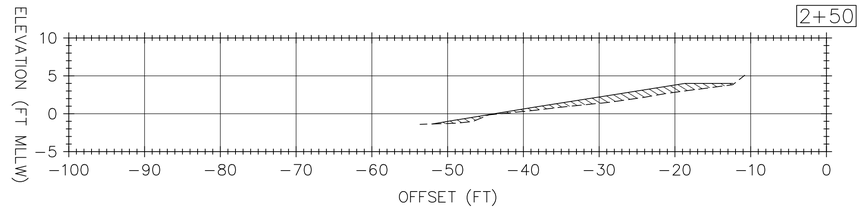
HONOLULU, OAHU, HAWAII

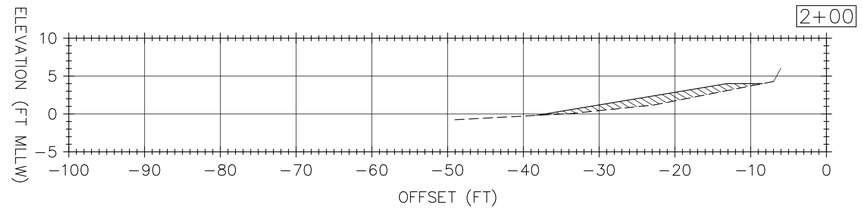
PROJECT NUMBER:	25455
PROJECT ENGINEER:	DL
DRAWN BY:	DL
CHECKED BY:	JB
SCALE:	VARIES
DATE:	MARCH 15, 2017

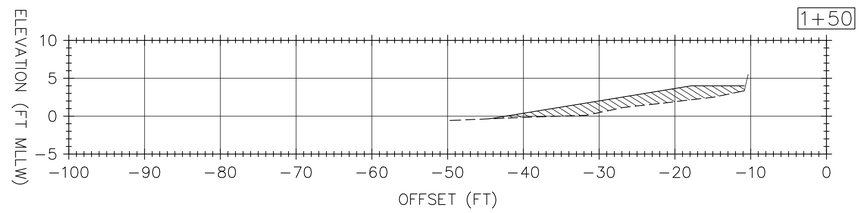
GROIN LAYOUT AND TYPICAL SECTIONS

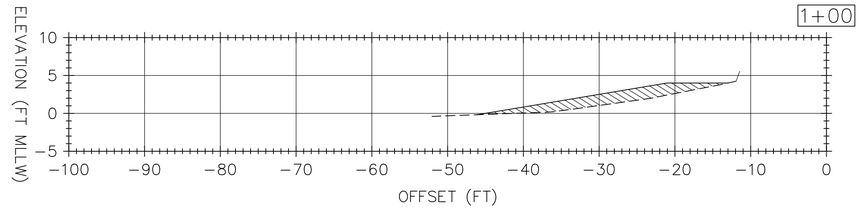
DRAWING NO.:	SHEET NO.:
C-001	4 of 5

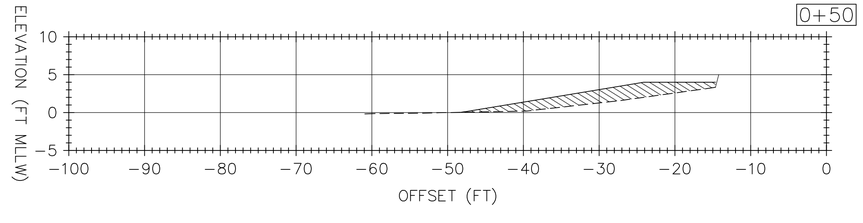


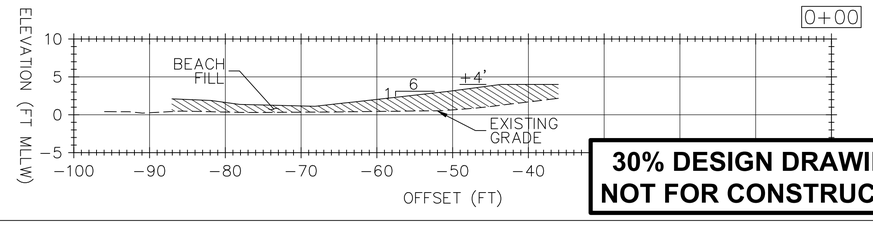












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REVISION	DATE

HAWAII KAI MARINA
ENTRANCE CHANNEL
GROIN REPLACEMENT
HONOLULU, OAHU, HAWAII

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SAND BACKPASSING
PLAN AND SECTIONS

DRAWING NO.:	SHEET NO.:
C-002	5 of 5