STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STREAM CHANNEL ALTERATION PERMIT APPLICATION

For Official Use Only:

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT

2025 JUL 28 AM 7:57

Instructions: Please print in ink or type and send one (1) completed hardcopy and one (1) digital copy of the application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Applications must be accompanied by a non-refundable filing fee of **$25.00** payable to the Department of Land and Natural Resources. The Commission may not accept incomplete applications without the required signatures. For assistance, call the Stream Protection and Management Branch at **587-0234**. For further information and updates to this application form, visit http://dlnr.hawaii.gov/cwrm.

☒ Check here to allow Commission staff to communicate primarily via e-mail.
Legally required and other key correspondence will still be transmitted via postal mail.

PERMIT TYPE:

1. Permit Applying For: ☒ New ☐ After-The-Fact

2. Type of Construction: ☒ Installation ☐ Modification ☒ Removal

APPLICANT INFORMATION

3. APPLICANT'S NAME / COMPANY	Applicant's Contact Person	Applicant's Phone
U.S. Army Garrison Hawaii, DPW	Peter G. Huller	(831) 229-5626 (Cell)
Applicant's Mailing Address 947 Wright Ave., Bldg. 104, WAAF Schofield Barracks, HI 96857-5000	Applicant's E-mail Address peter.g.huller.civ@army.mil	

☒ **Check here if project will impact multiple landowners.** *If project impacts multiple landowners, skip* ***Item 4*** below, *then complete and attach* ***Form LND-APP*** *to identify and verify landowner's approval of proposed stream channel alteration work.*

4. LANDOWNER'S NAME / COMPANY	Landowner's Contact Person	Landowner's Phone
U.S. Army Garrison Hawaii, DPW	Peter G. Huller	(831) 229-5626 (Cell)
Landowner's Mailing Address 947 Wright Ave., Bldg. 104, WAAF Schofield Barracks, HI 96857-5000	Landowner's E-mail Address peter.g.huller.civ@army.mil	

5. CONSULTANT'S NAME / COMPANY	Consultant's Contact Person	Consultant's Phone
Okahara and Associates, INC.	Matthew Fujioka	808-807-0294
Consultant's Mailing Address 201 Merchant Street, Suite 1650, Honolulu, HI 96813-2972	Consultant's E-mail Address mfujioka@okahara.com	

6. CONTRACTOR'S NAME / COMPANY	Contractor's Contact Person	Contractor's Phone
Contractor's Mailing Address	Contractor's E-mail Address	

STREAM INFORMATION

7. Island: *(Check only one)* ☐ Kauai ☒ Oahu ☐ Molokai ☐ Lanai ☐ Maui ☐ Hawaii

8. Tax Map Key(s) *List all affected tax map key parcels.*
1-1-008:001; 1-1-006: 001, 004, 013

9. Stream / Gulch Name(s) *List all affected streams and/or gulches.*
Kahauiki Stream

FOR OFFICIAL USE ONLY:	SWHU ID:	FILE ID:
LAT:	GWHU ID:	DOC ID:
LON:	REACH ID:	

GENERAL PROJECT INFORMATION

10. Project Type: *Check all that apply.*

☐ Bank Stabilization	☐ Bridge	☐ Channel Alignment	☐ Channel Lining	☒ Culvert	☐ Dam / Dike / Weir
☐ Desilting Area	☐ Drainage Outlet	☒ Dredging	☐ Ford Crossing	☐ Grading	☐ Levee / Flood Wall
☐ Restoration	☐ Retaining Wall	☐ Retention Basin	☐ Stream Gage	☐ Sewer Line	☐ Water Line

☐ Other - Describe:

11. Project Site Location(s): *Provide site coordinates of downstream-most point of project in degrees, minutes, seconds (NAD83).*

Latitude: 21° 20' 11" Longitude: -157° 53' 36" Elevation: -4.17 ft. above mean sea level

12. Structure Dimensions: *(feet)*

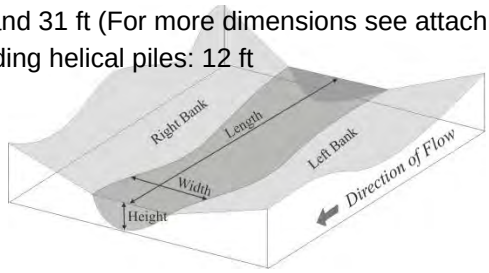
Provide generalized dimensions for the entire project / structure area. If the project includes a pipe (e.g., culvert, drain, etc.), provide the pipe diameter.

Width: Culvert Wall Width: 30 ft and 31 ft (For more dimensions see attachment C)

Height: Culvert Wall Height excluding helical piles: 12 ft

Length: Culvert length: 48.07 ft

Diameter: 36 inches



13. Structure Location:

Provide the general location of the stream channel alteration structure in relation to the streambank.

☐ Left bank *(downstream view)*

☐ Right bank *(downstream view)*

☒ Across entire stream channel

14. State Land Use Classification: *(Check all that apply)* ☐ Agriculture ☐ Conservation ☐ Rural ☒ Urban

LEGAL REQUIREMENTS

If required, the permits or approvals below must be obtained before the Commission on Water Resource Management can legally issue a permit. Visit the Commission's Applications & Forms webpage (http://dlnr.hawaii.gov/cwrm/info/forms/) for links to agency websites/contact information.

15. Conservation District Use Permit (CDUP): *To find out if your stream channel alteration project is located in a Conservation District (CD), you may visit to the Land Use Commission (LUC) website at http://luc.hawaii.gov/maps to view Land Use District Boundary maps. If the stream channel alteration will be located in a CD, contact the Department of Land and Natural Resources' Office of Conservation and Coastal Lands (OCCL) at (808) 587-0377 to determine is a CDUP is required.*

☐ Stream channel alteration is in a Conservation District.

- ☐ Required. CDUP #: _____ Date CDUP approved: _____
- ☐ Not Required. *Attach documentation from Office of Conservation and Coastal Lands (OCCL), Department of Land and Natural Resources.*
- ☐ I have not checked with the OCCL about whether or not a CDUP is required.

☒ Stream channel alteration is not in a Conservation District.

16. Special Management Area Permit (SMAP): *To determine if an SMAP is necessary, contact your County Planning Department.*

- ☐ Required. SMAP #: _____ Date SMAP approved: _____
- ☐ Not Required. *Attach documentation from applicable County agency.*
- ☒ I have not checked with the County about whether or not an SMA Permit is required.

17. State Historic Preservation Division (SHPD), Department of Land and Natural Resources: *If the parcel(s) affected by the stream alteration has been reviewed by the State Department of Land and Natural Resources Historic Preservation Division (SHPD or through an OEQC Environmental Review, Special Management Area Permit, etc.), check "yes" and attach any relevant documentation from SHDP. If the affected parcel(s) has not undergone SHDP review, attach a photograph of the affected area, a schematic diagram (showing the location, access road and infrastructure for the alteration), and a short description of the prior use(s) of the land on which the alteration resides.*

Please note: You are **strongly advised to contact the SHPD to obtain a pre-review of your project. In the event that you do not get an HP pre-review and if during the course of either review or the permit itself it is determined that you need SHPD's concurrence, your application or permit may be held in abeyance or denied until issues with HP are resolved. To contact SHPD, please call (808) 692-8015.*

☒ I have consulted the SHPD regarding potential impacts of stream channel alteration activities on historic sites. I have attached applicable documentation from the SHPD.

☐ I have not consulted with the SHPD regarding potential impacts of stream channel alteration activities on historic sites.

18. Chapter 343, Hawaii Revised Statutes, Hawaii Environmental Policy Act:

☐ An Environmental Assessment was completed, and

☐ An Environmental Impact Statement was required and has been accepted (attach letter of acceptance).

Publication date in The Environmental Notice: _____

☐ A Finding of No Significant Impact has been determined (attach letter).

Publication date in The Environmental Notice: _____

This project proposes:

- ☐ Use of state or county lands, or use of state or county funds
- ☐ Use within a state conservation district
- ☐ Use within a shoreline setback area
- ☐ Use within a national or Hawaii registered historic site
- ☐ Use within the Waikiki Special District
- ☐ The construction, expansion or modification of helicopter facility
- ☐ A wastewater treatment unit
- ☐ Waste-to-energy facility
- ☐ Landfill
- ☐ Oil refinery
- ☐ Power-generating facility
- ☒ None of the above 11 items

OTHER REGULATORY REQUIREMENTS

If the proposed stream channel alteration is subject to the following permits or approvals, indicate by checking the appropriate box below and submit either the approval letter from the appropriate agency or attach a copy of the application form. If the proposed stream channel alteration is not subject to the following permits or approvals, indicate by checking the "N/A" (Not Applicable) field.

	Attached	N/A
19. U.S. Army Corps of Engineers (Harbors and Rivers Act, Section 404, Clean Water Act)	☒	☐
20. State Department of Health, Clean Water Branch (Section 401, Clean Water Act, Water Quality Certification, Best Management Practices Plan)	☒	☐
21. Right-of-Entry or Right-of-Way Permit if the proposed stream channel alteration includes State lands. (Chapter 171, Hawaii Revised Statutes)	☒	☐
22. Hawaii Environmental Policy Act (Chapter 343, Hawaii Revised Statutes; Title 11, Chapter 200, Hawaii Administrative Rules)	☐	☒
23. Soil and Water Conservation District	☐	☒
24. County Certification of "No-Rise"	☐	☒
25. County Grading Permit	☐	☒
26. County Discretionary Permit(s)	☐	☒

CULTURAL IMPACTS

Articles IX and XII of the State Constitution, other state laws, and the courts of the State, require government agencies to promote and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups. If there is not enough space available, please make a note in the field (e.g., "See attached") and attach all information with this application as requested.

27. Please provide the identity and scope of cultural, historical, and natural resources in which traditional and customary native Hawaiian rights are exercised in the area.

NHPA Section 106 consultation with Native Hawaiian organizations identified that were once traditional Hawaiian fishponds in the area that no longer exist. These former fishpond locations adjacent to the stream channel are historic properties (as defined by NHPA) because the deep buried fill adjacent to the stream channel has the potential to be significant for scientific reasons, but the traditional cultural/historic resource (i.e. a fishpond) no longer exist and there is no ongoing exercise of traditional and customary Native Hawaiian rights associated with the former fishponds.

28. Identify the extent to which those resources, including traditional and customary Native Hawaiian rights, will be affected or impaired by the proposed action.

There will be no impaired Native Hawaiian rights by the dredging Kahauiki Stream A and B and the replacement of the existing culvert in Kahauiki Stream B. To avoid any impacts to cultural resources, dredging and vegetation removal is to remove built-up sediment and debris with no additional ground disturbance beneath the constructed canal.

29. What feasible action, if any, could be taken by the Commission on Water Resource Management in regards to your application to reasonably protection Native Hawaiian rights?

There is no action necessary by the CWRM to protect Native Hawaiian right as there will be no change to those rights from this project.

PROJECT DESCRIPTION

Please complete the following sections by providing detailed information on the project components identified below. If there is not enough space available, please make a note in the field (e.g., "See attached") and attach all information with this application as requested.

30. Describe the overall project scope and objectives.

Portions of Kahauiki Stream (Lower Ft. Shafter, Ohau, Hawaii), labeled "Kahauiki A" and "Kahauiki B" in the attached "Fort Shafter Flats Installation, Island of Oahu, Hawaii, Kahauiki Stream Maintenance Dredging, Phase 2" plans require dredging and drainage culvert clearing. The project base bid involves dredging Kahauiki Stream "A" from approximately from station 1+50 to 5+90, dredging Kahauiki Stream "B" from approximately from station 0+50 to 3+00, and cleaning out two existing concrete culvert drainpipes at Kahauiki Stream B which will remain.

Dredging in Kahauiki Stream A includes an area of solid coralline encountered during a previous maintenance dredging project. Both Kahauiki Stream A and B, stream slopes will be graded at a 2:1 slope. Kahauiki Stream A will be deepened to -5.5 Mean Sea Level and approximately 2,526 CY of native coralline substrate and accumulated alluvial sediment will be removed from 27,652 SF. Kahauiki Stream B will be deepened to -4.6 Mean Sea Level and 183 CY of sediment will be removed from 4,476 SF.

The project also includes bid option 1 to replace two (2) 36-inch reinforced concrete culvert drainage pipes, concrete headwalls, and the installation of new guardrails. The implementation of bid option 1 will be determined by the government's structural engineer recommendations, after dredging, cleanout, and examination of the existing culverts. This portion of the stream passes under Annex Road between Funston Loop and Mokumoa Street.

For plans, please see attachment B.

31. Describe existing stream channel and streamflow conditions at the site of the proposed stream channel alteration.

The project site is generally located along Kahauiki Stream "A" the southwestern portion of Fort Shafter Flats Installation. In general, the section of Kahauiki Stream "A" included in this study was observed to be in a northeast to southwest orientation and is located near the stream's intersection with Moanalua Stream to the west. The section of Kahauiki Stream "B" included in this study was observed to be in an east to west orientation and is located near the stream's intersection with Kahauiki Stream "A" to the west. The project site is identified as TMK 1-1-006:001, 1-1-006:004, and 1-1-008:001 owned by the United States of America and TMK 1-1-006:013 owned by the State of Hawaii. See Attachment B for Issuance of Right-of-entry on TMK 1-1-006:013.

Kahauiki Stream is prone to flooding with record of historical flood events. The principal cause of flooding of the lower reaches of Kalihi and Moanalua Streams are the restricted capacities of the numerous bridges at the mouths of the streams. To mitigate historical flood events, dredging efforts were initiated in 2020, but were not completed due to a number of differing site conditions, including a solid rock formation, and permitting complications.

This project would serve to remove the solid coral and complete the dredging of Kahauiki Stream (Kahauiki A). In order to create a fully functioning stream system passing under Annex Road (Kahauiki B), unblocking and potential repair/replacement the two (2) existing 36-inch reinforced concrete drainage pipes is recommended.

32. Identify and describe the project components outlined below

A. Materials

Materials for New Culvert	
AC Pavement, 3" Thick	Structural Concrete
AC Pavement Aggregate	Rebar Reinforcement
Themoplastic, white or yellow, 4" wide	Helical Piles, 60' Deep
Guardrails and Barriers	Reinforced Concrete Pipes, 36" Dia.
Floating Turbidity Curtain	Trench Aggregate
Reinforced Concrete Jack	Geotextile fabric
	CLSM

B. Quantities

Materials for New Culvert	
AC Pavement, 3" Thick = 805 S.F.	Structural Concrete= 62 CY
AC Pavement Aggregate = 15 CY	Rebar Reinforcement= 8,900 lb
Themoplastic, white or yellow, 4" wide = 20 L.F.	Helical Piles, 60' Deep= 45 EA
Guardrails and Barriers = 110 L.F.	Reinforced Concrete Pipes, 36" Dia. = 77 L.F.
Floating Turbidity Curtain = 514 L.F.	Trench Aggregate= 62 CY
Reinforced Concrete Jack = 35 L.F.	Geotextile fabric= 226 SY
	CLSM = 65 CY

C. Excavation

Kahauiki Stream A Dredging Excavation (2,526 CY)
Kahauiki Stream B Dredging Excavation (183 CY)
New Culvert Excavation (1 CY)

D. Fill

Kahauiki Stream A Dredging Excavation (0 CY)
Kahauiki Stream B Dredging Excavation (0 CY)
New Culvert Excavation (14 CY)

E. Disposal

Kahauiki Stream A Dredging Excavation (2,526 CY)
Kahauiki Stream B Dredging Excavation (183 CY)
New Culvert Excavation (300 CY)

F. Construction methods

Dredging
Sheet Piles

G. Temporary facilities

No, temporary facilities needed.

H Expected period of time required for construction

Expected construction period to be from July 2025 to December 2025.

I. Liability during construction

The contractor will carry all the appropriate liability insurance to cover any potential accidents that may occur.

33. Describe the project's consistency with county zoning and development plans.
The project is located in zoning classification F-1 (Federal and Military Preservation District) and I-2 (Intensive Industrial District) and is consistent with county zoning requirements.

The project is consistent with Oahu's "Primary Urban Center Development Plan" dated June 2004.

34. Identify potential alternatives to the project and describe the relative costs and benefits of each alternative.
A potential alternative is to not dredge the stream or clear the existing culverts. Resulting in no water flow under Annex Road and leave the area prone to flooding.

SUBMITTALS

Please submit the following plans, maps, or drawings in legible form, preferably on 8.5" by 11" sheets.

35. Location Map: Provide a location map of the proposed project relative to major roadways.

36. Plans / Elevations / Sections: Provide a plan view of the proposed stream channel alteration structure in relation to the stream channel and property boundaries. Elevation and section views of the structure in relation to the stream channel should also be provided if available.

SIGNATURES

Signing below indicates that the signatories understand and swear that the information provided is accurate and true to the best of their knowledge. Further, the signatories understand that if the permit requested is granted by the Commission on Water Resource Management (Commission), the permit shall be subject to the following conditions:

1) The proposed work is to be completed within two (2) years from the date of permit approval.
2) The permittee shall notify the Commission, by letter, of the actual dates of project initiation and completion.
3) The permittee shall submit a set of as-built plans and photographs to the Commission upon completion of the project.
4) The permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months.
5) If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

37. APPLICANT

Print Name:	Signature:	Date:
Peter G. Huller		15 JUL 2025

38. CONSULTANT

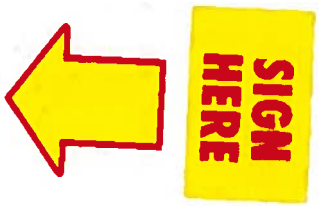
Print Name:	Signature:	Date:
Matthew Fujioka		18 JUL 2025

39. CONTRACTOR

Print Name:	Signature:	Date:

40. LANDOWNER *(If multiple landowners, skip **Section 53**, then complete and attach **Form SCAP-LND** with appropriate landowner signatures.)*

Print Name:	Signature:	Date:
Peter G. Huller		15 JUL 2025



CHECKLIST FOR A COMPLETE APPLICATION and ITEM DESCRIPTIONS (ITEMS 1 - 14)

- □ Fill in the most recent application form (check **http://dlnr.hawaii.gov/cwrm** or call 587-0234 for updates).
- □ Fill in every line which includes Items 1-40, as indicated (total 8 pages).
- □ Enclose a check for $25 payable to the Department of Land and Natural Resources.
- □ Mark the proposed stream channel alteration location on: the appropriate USGS quad map, TMK map, photo and schematic, and attach to the application.
- □ Attach Form LND-APP to identify and obtain authorizations for the project if multiple landowners will be impacted.
- □ Attach a grading plan and cross section profiles showing existing and finish grades, if available.
- □ Attach documentation from CDUP, SMAP, SHPD when applicable regarding Items 15-17.
- □ Attach letters from U.S. Army Corps of Engineers, Hawaii Department of Health, Office of Conservation and Coastal Lands, and appropriate county agencies regarding Items 18-26.
- □ Provide digital copies on CD-ROM or via e-mail, if available.
- □ Obtain the necessary signatures for the application form.

Send the application and maps, copies, and the filing fee to:
Commission on Water Resource Management
P.O. Box 621
Honolulu, HI 96809

PERMIT TYPE

1. **Permit Status:** Indicate whether this application is for a new stream channel alteration project (including medication or abandonment) or if the project has already been completed and an after-the-fact permit is being applied for.
2. **Type of Construction:** Is the permit application for the installation of a new stream channel alteration, or modification or removal of an existing stream channel structure.

APPLICANT INFORMATION

3. **Applicant's Information:** Fill in the information for the applicant. This should be the entity that will be responsible for the maintenance of the stream channel alteration when the project is completed.
4. **Landowner's Information:** Fill in the information for the landowner of the property where the stream channel alteration will be located.
5. **Consultant's Information:** Fill in the information for the consultant who will assist with plan and design preparation for the subject project.
6. **Contractor's information:** Fill in the information for the contractor who will perform the work on the subject stream channel alteration project.

STREAM INFORMATION

7. **Island:** The island name where the stream channel alteration will be located.
8. **TMK:** Tax Map Key number (generally there is no lot number, but where a parcel is divided into two lots, fill in the lot number)
9. **Stream / Gulch Name:** Name of the stream or gulch where the stream channel alteration will be located.

GENERAL PROJECT INFORMATION

10. **Project Type:** Identify the type of work being performed, and select all that apply to the project.
11. **Project Site Location(s):** Fill in stream channel alteration location coordinates taken from a GPS unit at the project site. Units are Degrees, Minutes and Seconds (seconds should be filled out to at least one decimal place; e.g. 19°59'32.8"N, 155°14'51.5"W). If more than one site, attach separate sheet. Elevations should be provided in feet above mean sea level.
12. **Structure Dimensions:** What are the physical dimensions of the stream channel alteration structure that will be located in or adjacent to the stream channel?
13. **Structure Location:** Will the structure be located on the right or left bank (facing downstream) or across the entire stream channel?
14. **State Land Use Classification:** Identify the current State Land Use Classification.

Please see header descriptions for remaining Sections in completing Items 15 to 40.

Please find the following attachments:

Attachment A: Form LND-APP

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit; Moanalua, Honolulu, Oahu, Tax Key: (1) 1-1-006: portion of 013.

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

Attachment D: State Historic Preservation Division (SHPD), Department of Land and Natural Resources Consultation

Attachment E: 01-02-2020 Record of Environmental Consideration

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

Attachment G: State Department of Health, Clean Water Branch Section 401

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
MULTIPLE LANDOWNERS/LOCATIONS FORM

For Official Use Only:

Instructions: Please print in ink or type and send completed form attached to stream channel alteration or stream diversion works permit application to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete applications without the required landowner signatures. For assistance, contact the Stream Protection and Management Branch at **587-0234**. For further information and updates to this application form, visit http://dlnr.hawaii.gov/cwrm.

A. LANDOWNER INFORMATION

For proposed stream channel alterations and stream diversion works affecting multiple landowners, complete the sections below for each individual landowner. ***Form LND-APP*** provides space for information on five (5) landowners. Complete as many forms as necessary to identify all, and only those, landowners affected by the proposed stream channel alteration or stream diversion works.

1. LANDOWNER'S NAME/COMPANY	Landowner's Contact Person	Landowner's Phone
U.S. Army Garrison Hawaii, DPW	Peter G. Huller	Teams: (520) 687-1238 Jabber: (808) 787-0162 Cell: (831) 229-5626
Landowner's Mailing Address 947 Wright Ave., Bldg. 104, WAAF Schofield Barracks, HI 96857	Tax Map Key Parcel(s) 1-1-008:001; 1-1-006: 001, 004	
	Landowner's E-mail Address peter.g.huller.civ@army.mil	
Print Name:	**Signature:**	**Date:**

2. LANDOWNER'S NAME/COMPANY	Landowner's Contact Person	Landowner's Phone
State of Hawaii		
Landowner's Mailing Address Please see attachment B for more information.	Tax Map Key Parcel(s) 1-1-006: 013	
	Landowner's E-mail Address	
Print Name:	**Signature:**	**Date:**

3. LANDOWNER'S NAME/COMPANY	Landowner's Contact Person	Landowner's Phone
Landowner's Mailing Address	Tax Map Key Parcel(s)	
	Landowner's E-mail Address	
Print Name:	**Signature:**	**Date:**

4. LANDOWNER'S NAME/COMPANY	Landowner's Contact Person	Landowner's Phone
Landowner's Mailing Address	Tax Map Key Parcel(s)	
	Landowner's E-mail Address	
Print Name:	**Signature:**	**Date:**

5. LANDOWNER'S NAME/COMPANY	Landowner's Contact Person	Landowner's Phone
Landowner's Mailing Address	Tax Map Key Parcel(s)	
	Landowner's E-mail Address	
Print Name:	**Signature:**	**Date:**

Attachment A: Form LND-APP

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 2, 2020

James M. Nelson
Chief, Real Estate
U.S. Army Corps of Engineers
Honolulu District
Building 230, CEPOH-RE
Fort Shafter, Hawaii 96858-5440

Dear Mr. Nelson:

Subject: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit; Moanalua, Honolulu, Oahu, Tax Map Key: (1) 1-1-006: portion of 013.

At its meeting on June 26, 2020, under agenda item D-1, the Board of Land and Natural Resources ("Board") approved the easement request. We will request the Department of Accounting and General Services, Survey Division to prepare the map and legal description of the subject easement. Upon receipt of the items, we will request the Department of Attorney General to prepare the easement document for your signature.

Pursuant to the authority granted in the above-mentioned Board action, United States of America, Army Corps of Engineers ("ACOE"), its contractors, consultants and/or persons acting for or on its behalf are hereby granted a right-of-entry permit for drainage and flowage purposes onto State lands, identified as tax map key: (1) 1-1-006: portion of 013, portion of Kahauiki Stream containing 16,804 sq. ft., as shown on the attached map labeled Exhibit 1, subject to the following terms and conditions:

1. Upon acceptance of the terms and conditions herein this right-of-entry permit shall be effective and expire upon issuance of the requested easement.

2. At all times herein, ACOE, its contractors, consultants and/or persons acting for or on its behalf in the exercise of this right-of-entry shall keep the right-of-entry area or premises in a strictly clean, sanitary and orderly condition.

3. If any action of the ACOE, its contractors, consultants and/or persons acting for or on its behalf in the exercise of this right-of-entry results in damage to the real

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit

property, ACOE, its contractors, consultants and/or persons acting for or on its behalf will at its option, either repair such damage or make an appropriate settlement with the State. In no event shall the repair or replacement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. ACOE's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The provisions of this clause are without prejudice to any rights the State may have to make a claim under applicable law for any other damages than provided herein.

4. During of the term of this right-of-entry, ACOE shall be liable for any loss or injury to person related to the activities described above in accordance with, and to the extent permitted under, the Federal Tort Claims Act (28 U.S.C. 1346 (b) and 2671 et seq).

5. In consideration of the issuance of this right-of-entry, ACOE, its contractors, consultants and/or persons acting for or on its behalf releases the State and its employees and representatives from all claims or liability for any loss that might occur while on the demised premises for whatever reason or cause.

6. ACOE, its contractors, consultants and/or persons acting for or on its behalf, acknowledges and agrees that the State has made no effort to determine or remedy possible hazards located thereon, and that the ACOE, its contractors, consultants and/or persons acting for or on its behalf enters such lands at its own risk.

7. ACOE, its contractors, consultants, and/or persons acting for or on its behalf shall comply with all laws, statutes, ordinances, rules, and regulations of the Federal, State, and County governments affecting the right of entry area to the extent that compliance is consistent with Federal law and the Supremacy Clause of the United States Constitution.

8. ACOE shall ensure that its contractors, consultants and/or persons acting for or on its behalf shall procure, at its own expense, and maintain during the entire period of this right-of-entry, from an insurance company or companies licensed to do business in the State of Hawaii, a policy or policies of comprehensive public liability insurance in an amount of at least $1,000,000 per occurrence and $2,000,000 aggregate and insuring the State of Hawaii against all claims for personal injury, death, and property damage; that said policy shall cover the entire right-of-entry area, in the control or use of the ACOE, its contractors, consultants and/or persons acting for or on its behalf.

9. ACOE, its contractors, consultants and/or persons acting for or on its behalf shall not cause or permit the escape, disposal or release of any hazardous materials except as permitted by law. The ACOE, its contractors, consultants and/or persons acting for or on its behalf shall not allow the storage or use of such materials in any manner not sanctioned by law or regulation, or if the material is unregulated, to the

highest standards prevailing in the industry for the storage and use of such materials, nor allow to be brought onto the right-of-entry area any such materials except to use in the ordinary course of business of the ACOE, its contractors, consultants and/or persons acting for or on its behalf, and then only after written notice is given to the State of the identity of such materials and upon the State's consent which may be withheld at the State's sole and absolute discretion.

10. ACOE, its contractors, consultants and/or persons acting for or on its behalf shall be responsible for damage or injury caused by or resulting from any act or omission of the ACOE, its contractors, consultants and/or persons acting for or on its behalf in connection with the release of hazardous materials on the right-of-entry area occurring or resulting from the activities of the ACOE, its contractors, consultants and/or persons acting for or on its behalf or elsewhere if caused by the ACOE, its contractors, consultants and/or persons acting for or on its behalf. These covenants shall survive the expiration or earlier termination of this right-of-entry

    For purposes of this right-of-entry, "hazardous material" shall mean any pollutant, toxic substance, hazardous substance, or oil as defined in pursuant to the Resource Conservation and Recovery Act (RCRA) as amended, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the Federal Clean Water Act, or any ordinance, rule, or by-law, whether existing as of the date hereof, previously enforced, or subsequently enacted, to the extent such definition and such law, regulation, ordinance, rule, or by-law is consistent with Federal law and the Supremacy Clause of the United States Constitution.

11. ACOE, its consultants, contractors and/or persons acting for or on its behalf in the exercise of this right-of-entry shall use appropriate precautions and measures to minimize inconveniences to surrounding residents, landowners, and the public in general.

12. ACOE, its consultants, contractors and/or persons acting for or on its behalf shall maintain and employ debris, pollution and contamination control measures, safeguards and techniques to prevent debris, pollution or contamination to the ocean waters, streams or waterways resulting from ACOE, its consultants, contractors and/or persons acting for or on its behalf use, maintenance, repair and operation of the right-of-entry area or premises, and shall take immediate corrective action in the event of such pollution or contamination to immediately remove the cause of such pollution or contamination, and shall immediately clean the right-of-entry area or premises and its surrounding waters of such pollutant or contaminant and restore to the State of Hawaii, Department of Land and Natural Resources satisfaction the areas affected by such pollution or contamination, all at ACOE, its consultants, contractors and/or persons acting for or on its behalf own cost and expense.

13. In the event any unanticipated sites or remains such as bone or charcoal deposits, human burials, rock or coral alignments, pavings or walls are encountered ACOE,

its consultants, contractors, and/or persons acting for or on its behalf shall stop work and contact the State Historic Preservations Division immediately.

14. The Department of Land and Natural Resources reserves the right to impose additional, but responsible terms and conditions as it deems necessary while this right-of-entry permit is in force.

Should you have no objections to the above terms and conditions, kindly submit a signed copy of this letter to the Oahu District Land Office. If you have any questions, please contact Darlene Bryant-Takamatsu of our Land Division at (808) 587-0447, or email at darlene.bryant@hawaii.gov.

Sincerely,

Suzanne D. Case
Chairperson

RT

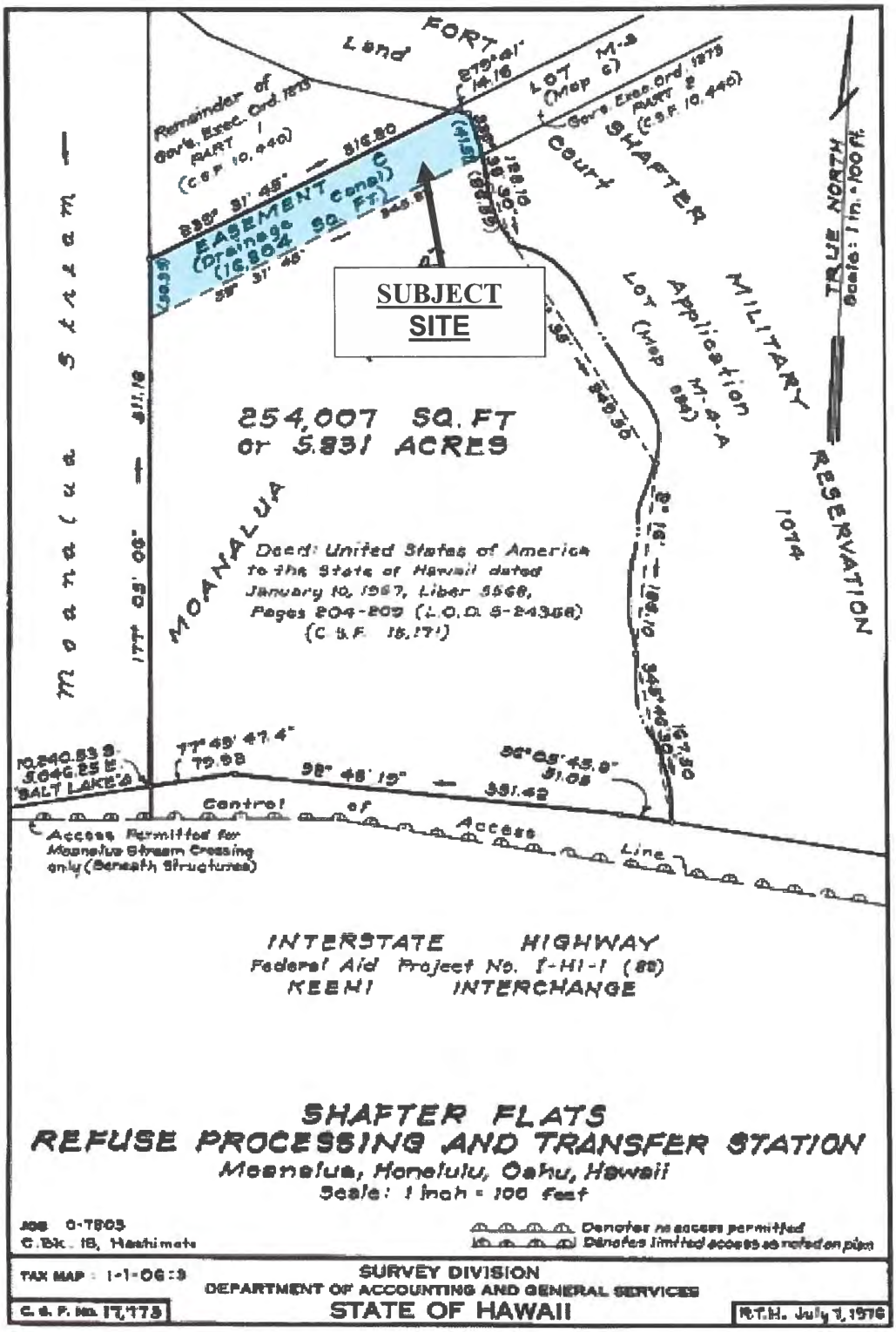
Enclosure

ACCEPT:
United State of America

_____

By:
Its:
Date:

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit



TMK (1) 1-1-006: portion of 013

EXHIBIT 1

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division
Honolulu, Hawaii 96813

June 26, 2020

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

PSF No.: 20OD-022

OAHU

Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit; Moanalua, Honolulu, Oahu, Tax Map Key: (1) 1-1-006: portion of 013.

APPLICANT:

United States of America, Army Corps of Engineers ("Applicant").

LEGAL REFERENCE:

Section 171-55 and 95 Hawaii Revised Statutes ("HRS"), as amended.

LOCATION:

Portion of Government lands situated at Moanalua, Honolulu, Oahu, Tax Map Key: (1) 1-1-006: portion of 013, as shown on the maps attached as **Exhibit A1** and **A2**.

AREA:

16,804 square feet, more or less.

ZONING:

State Land Use District:	Urban
City & County of Honolulu LUO:	I-2, Intensive Industrial

TRUST LAND STATUS:

Section 5(e) lands of the Hawaii Admission Act
DHHL 30% entitlement lands pursuant to the Hawaii State Constitution: NO

APPROVED BY THE BOARD OF
LAND AND NATURAL RESOURCES
AT ITS MEETING HELD ON
June 26, 2020 Go.

D-1

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit

CURRENT USE STATUS:

Governor's Executive Order No. 2840 ("EO 2840") setting aside to the City and County of Honolulu for Refuse Processing and Transfer Station.

CHARACTER OF USE:

Right, privilege and authority to conduct, construct, use, maintain, repair, replace and remove drainage and flowage control measures over, under and across State-owned land.

COMMENCEMENT DATE:

To be determined by the Chairperson.

CONSIDERATION:

Gratis

CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:

In accordance with Hawaii Administrative Rules ("HAR") § 11-200.1-15 and the Exemption List for the Department of Land and Natural Resources reviewed and concurred on by the Environmental Council on March 3, 2020, the subject request is exempt from the preparation of an environmental assessment pursuant to Exemption Class No. 1, "Operations, repairs, or maintenance of existing structures, facilities, equipment, or topographical features, involving negligible or no expansion or change of use beyond that previously existing," Part 1, item 40 that states, "creation or termination of easement, covenants, or other rights in structures or land." See **Exhibit B**.

DCCA VERIFICATION:

Not applicable. Government agency.

APPLICANT REQUIREMENTS:

None

REMARKS:

The subject parcel was a portion of lands determined by the United States as no longer needed and conveyed back to the State of Hawaii on January 10, 1967 under Land Office Deed No S-24,358. On June 2, 1977 the subject parcel was set aside to the City and County of Honolulu ("City") under EO 2840 for the Refuse Processing and Transfer Station. The set aside included a portion of the Kahauiki Stream that flows into Moanalua Stream on the northern end of the parcel, designated as Easement C and reserved to the State of

Hawaii for a drainage canal.

The Applicant requests that the Board of Land and Natural Resources ("Board") authorize a grant of easement over Easement C in the subject parcel to mitigate periodic flooding in the adjacent area of Fort Shafter Flats. The US Army Corps of Engineers intends a flooding mitigation project to clear then maintain the stream as needed to ensure free flow of water.

In response for comments from other Government agencies, the Board of Water Supply, the Department of Design and Construction, and the Department of Environmental Services and Department of Facilities Maintenance have no objection/comment to the request and concurs with the proposed EA exemption. The Division of Aquatic Resources, and the Office of Hawaiian Affairs have not responded to solicitation for comment before the response deadline.

The Applicant is requesting a right-of-entry prior to the issuance of the easement document to allow the proposed flooding mitigation project to begin and staff has no objection to the request.

RECOMMENDATION: That the Board:

1. Declare that, after considering the potential effects of the proposed disposition as provided by Chapter 343, HRS, and Chapter 11-200.1-15, HAR, this project will probably have minimal or no significant effect on the environment and is therefore exempt from the preparation of an environmental assessment.

2. Authorize the issuance of a perpetual, non-exclusive easement to United States of America, Army Corps of Engineers covering the subject area for drainage and flowage purposes under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:

   A. The standard terms and conditions of the most current perpetual easement document form, as may be amended from time to time;

   B. Review and approval by the Department of the Attorney General; and

   C. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.

3. Authorize the issuance of a right-of-entry permit to United States of America, Army Corps of Engineers covering the subject area under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:

A. The standard terms and conditions of the most current right-of-entry permit form, as may be amended from time to time; and

B. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.

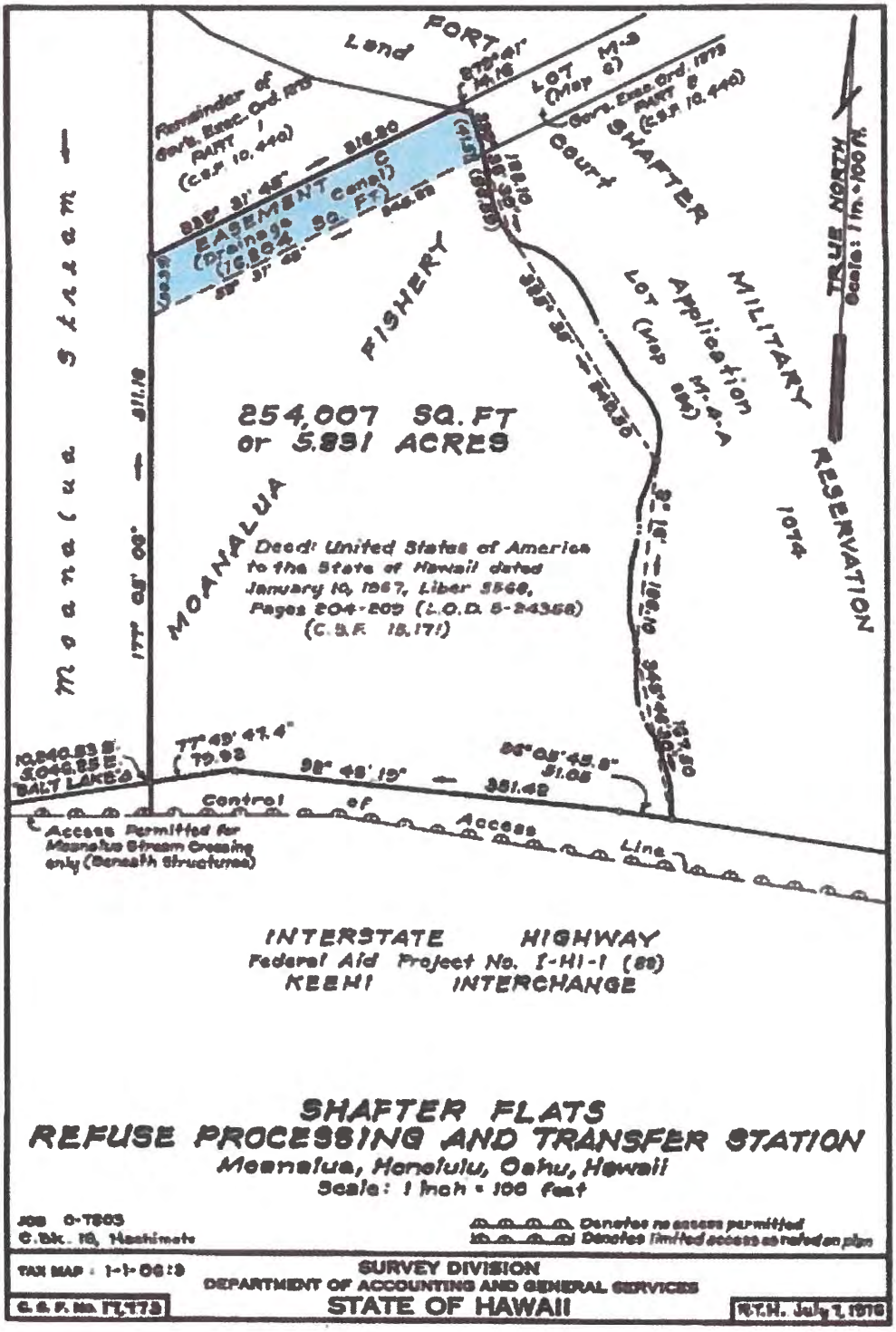
Respectfully Submitted,

Darlene J. Bryant-Takamatsu
Land Agent

APPROVED FOR SUBMITTAL:

Suzanne D. Case, Chairperson

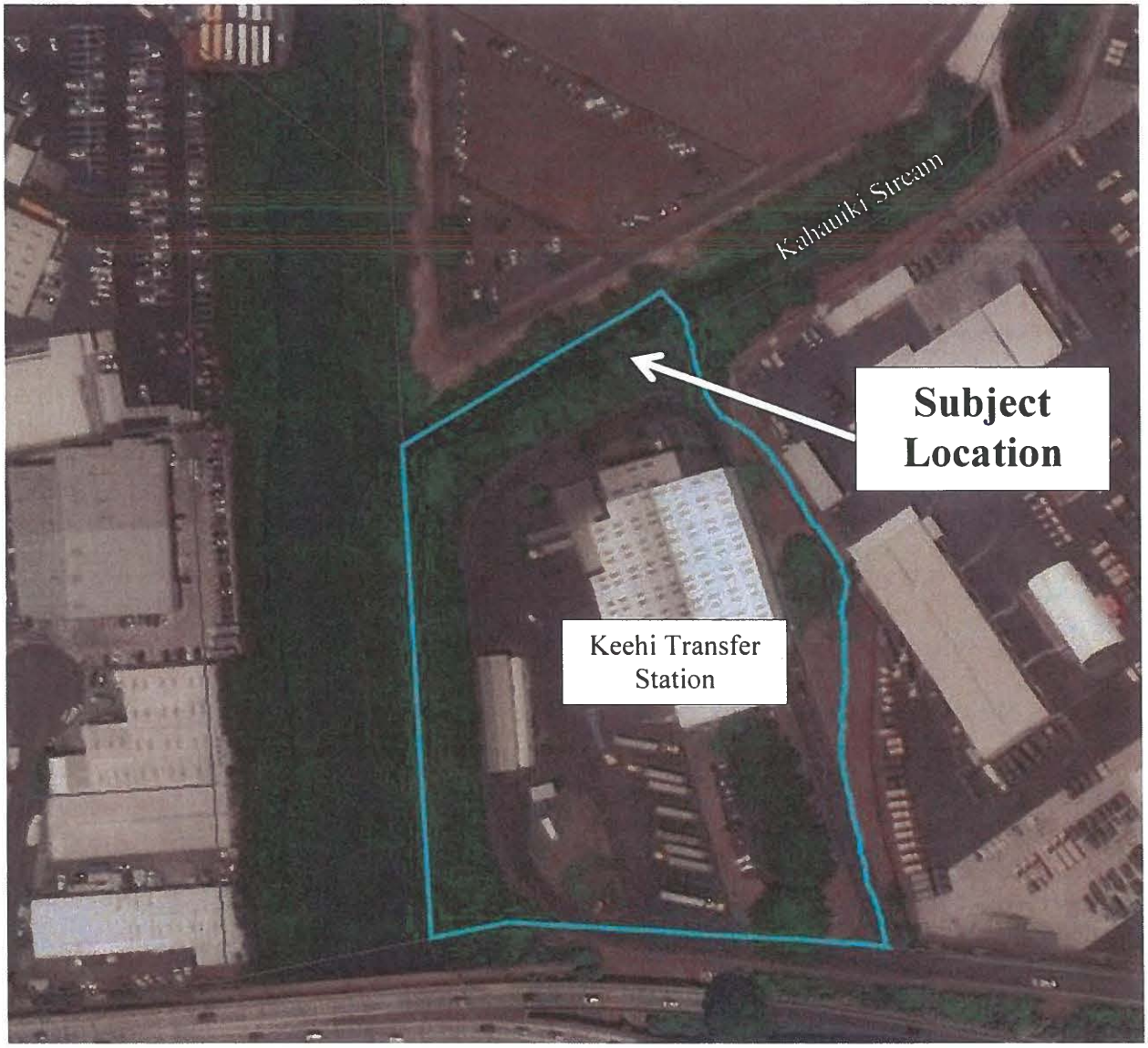
Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit



TMK (1) 1-1-006: portion of 013

EXHIBIT A1

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit



TMK (1) 1-1-006: portion of 013

EXHIBIT A2

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit

EXEMPTION NOTIFICATION

Regarding the preparation of an environmental assessment pursuant to Chapter 343, HRS and Chapter 11-200.1, Hawaii Administrative Rules.

Project Title:	Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers, for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit.
Project / Reference No.:	20OD-022
Project Location:	Moanalua, Honolulu, Oahu, Tax Map Key: (1) 1-1-006:portion of 013.
Project Description:	Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers, for Drainage and Flowage Purposes.
Chap. 343 Trigger(s):	Use of State Land
Exemption Class No.:	In accordance with Hawaii Administrative Rule Section 11-200.1-15 and the Exemption List for the Department of Land and Natural Resources reviewed and concurred by the Environmental Council on March 3, 2020, the subject request is exempt from the preparation of an environmental assessment pursuant to Exemption Class No. 1, "Operations, repairs, or maintenance of existing structures, facilities, equipment, or topographical features, involving negligible or no expansion or change of use beyond that previously existing," Part 1, item 40 that states, "creation or termination of easement, covenants, or other rights in structures or land."
Cumulative Impact of Planned Successive Actions in Same Place Significant?	No. There is no projected negative cumulative impact due to successive action.
Action May Have Significant Impact on Particularly Sensitive Environment:	No. Any particularly sensitive environmental issues for the subject area were not brought to the attention of the Division.
Consulted Parties	Agencies as noted in the submittal.

EXHIBIT B

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit

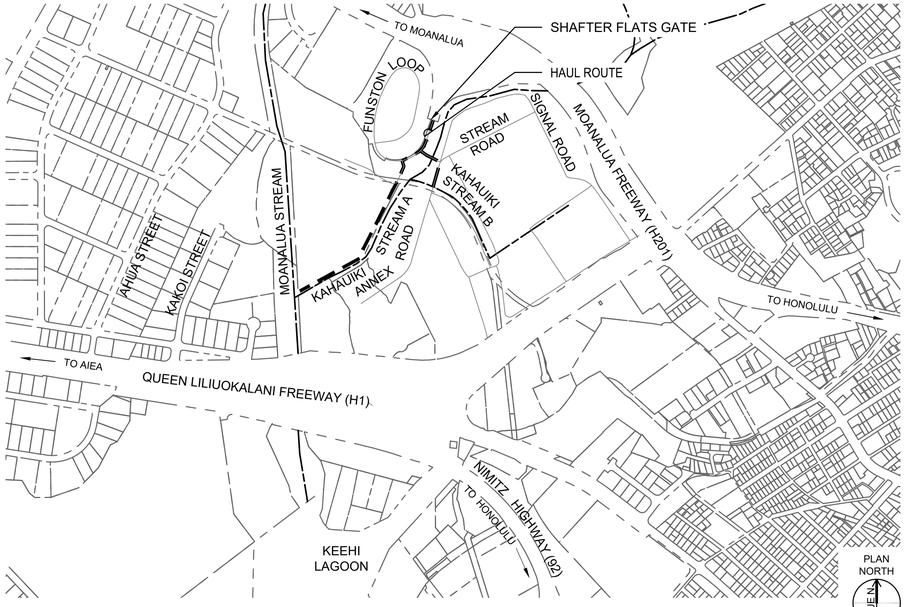
Analysis:	Based on the above mentioned, staff believes there would be no significant impact to the environment.
Recommendation:	That the Board finds this project will probably have minimal or no significant effect on the environment and is presumed to be exempt from the preparation of an environmental assessment.

Attachment B: Grant of Perpetual, Non-Exclusive Easement to the United States of America, Army Corps of Engineers for Drainage and Flowage Purposes and Issuance of Right-of-Entry Permit

US Army Corps of Engineers®

Honolulu District

FORT SHAFTER FLATS INSTALLATION, ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2



D1 LOCATION MAP

SCALE: 1" = 8,000'

8,000' 0 8,000' 16,000'

SOLICITATION NO.: TBD

CONTRACT NO.: TBD

ISSUE DATE: TBD

PROJECT DIRECTORY:

CLIENT:
USACE, HONOLULU DISTRICT
HONOLULU DISTRICT, BLDG. 252
FORT SHAFTER, HI, 96858-5440
CONTACT: IRIS ENDO
PHONE: (808) 656-2460
E-MAIL: IRIS.E.ENDO@USACE.ARMY.MIL

STRUCTURAL:
KAI HAWAII, INC.
50 S. BERETANIA STREET, #C-119C
HONOLULU, HI, 96813
CONTACT: JERRY FUJITA
PHONE: (808) 791-3969
E-MAIL: JFUJITA@KAIHAWAII.COM

PROJECT MANAGEMENT:
OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI, 96813-2972
CONTACT: MATTHEW FUJIOKA
PHONE: (808) 807-0294
E-MAIL: MFUJIOKA@OKAHARA.COM

GEOTECHNICAL:
KOKUA GEOTECHNICAL LLC
1017 N KING STREET
HONOLULU, HI, 96817
CONTACT: A.J. FELKEL
PHONE: (808) 214-9339
E-MAIL: AJ@KOKUAGEOTECH.COM

CIVIL:
OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI, 96813-2972
CONTACT: MATTHEW FUJIOKA
PHONE: (808) 524-1224
E-MAIL: MFUJIOKA@OKAHARA.COM

COST ESTIMATING:
J. UNO & ASSOCIATES, INC.
1210 WARD AVE, SUITE 204
HONOLULU, HI, 96814
CONTACT: HECTOR GARCIA
PHONE: (808) 947-6855
E-MAIL: HECTOR@J-UNO.COM

OPTION DESCRIPTIONS

BASE BID

ITEMS IN BASE BID:

- DREDGE EXIST. STREAM AND CLEAN OUT TWO EXIST. CULVERTS TO REMAIN.
- GOVERNMENT'S STRUCTURAL ENGINEER AND CONTRACTING OFFICER TO EXAMINE AND ASSESS THE TWO EXIST. CULVERTS AFTER DREDGING AND CLEANING OF THE PIPES BY THE CONTRACTOR. CONTRACTING OFFICER TO NOTIFY CONTRACTOR ON THE NEED TO IMPLEMENT BID OPTION 1 BASED ON THE GOVERNMENT'S STRUCTURAL ENGINEER'S RECOMMENDATIONS.
- CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER WHEN THE DREDGING AND CLEANING OF TWO EXIST. CULVERTS WILL BE COMPLETED AND INCLUDE TIME IN THE CONSTRUCTION SCHEDULE FOR THE STRUCTURAL ENGINEER'S ASSESSMENT OF THE EXIST. CULVERTS.

BID OPTION 1

ITEMS IN OPTION:

- DEMOLISH AND REPLACE TWO EXIST. CULVERTS AND CONC. HEADWALLS
- INSTALL NEW GUARDRAILS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

COVER SHEET

SHEET ID

G-001

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
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ABBREVIATIONS

AC	ASPHALT CONCRETE
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ARV	AIR RELIEF VALVE
ASC	ASBESTOS CEMENT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BC	BOTTOM CURB/BEGIN CURVE
BLDG	BUILDING
℄	BASELINE
BMPS	BEST MANAGEMENT PRACTICES
BOT	BOTTOM
BW	BOTTOM OF WALL
BWS	BOARD OF WATER SUPPLY
℄	CENTERLINE
CATV	CABLE TV
CL	CLASS
CLF	CHAIN LINK FENCE
CLR	CLEAR
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COL (TYP.)	COLUMN TYPICAL
CONC.	CONCRETE
CONN.	CONNECTION
CONT.	CONTINUOUS
COR	CONTRACTING OFFICER'S REPRESENTATIVE
C.O.S.A.	CONTRACTOR OPERATIONS AND STORAGE AREA
CY	CUBIC YARD
CRM	CONCRETE RUBBLE MASONRY
DET.	DETAIL
DI	DRAIN INLET OR DUCTILE IRON
DOH	DEPARTMENT OF HEALTH
DPW	DIRECTORATE OF PUBLIC WORKS
DWG	DRAWING
E/ELEC	ELECTRIC
EOP	EDGE OF PAVEMENT
ELEV/EL	ELEVATION
ESCP	EROSION AND SEDIMENT CONTROL PLAN
(E)	EXISTING
EXIST.	EXISTING
FH	FIRE HYDRANT
FT	FEET
GV	GATE VALVE
GW	GUY WIRE
H	HEIGHT/HORIZONTAL
HB	HOSE BIBB
HECO	HAWAIIAN ELECTRIC COMPANY
HORIZ	HORIZONTAL
INV.	INVERT
L	LEFT
LF	LINEAR FOOT
LP	LIGHT/LAMP POLE
MAX	MAXIMUM
MECH	MECHANICAL
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MS4	MUNICIPAL SEPARATE STORM SEWER SYSTEM
MSL	MEAN SEA LEVEL
N	NORTHING
NO.	NUMBER
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
O/H	OVERHEAD
O/S	OFFSET
PAV'T/P	PAVEMENT
PC	POINT-OF-CURVE
PCC	PORTLAND CEMENT CONCRETE
ℙ	PROPERTY LINE
PT	POINT-OF-TANGENT
PVC	POLYVINYL CHLORIDE
R	RIGHT
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REINF	REINFORCED
R/W	RIGHT-OF-WAY
S	SEWER/SLOPE/SPREAD
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FEET
SHT.	SHEET
SL	SEWER LINE/STREET LIGHT
SLB	STREET LIGHT BOX
SMH	SEWER MANHOLE
SPECS	SPECIFICATIONS
SPR	SPRINKLER
SQ	SQUARE
ST	STREET
STA.	STATION
STRUCT	STRUCTURAL
T	TOP
TC	TOP CURB
TEL	TELEPHONE
TEL BOX	TELEPHONE BOX
TMK	TAX MAP KEY
TOPO	TOPOGRAPHIC SURVEY
TP	TOP PIPE/TOP PAVEMENT
TW	TOP OF WALL
TYP	TYPICAL
UP	UTILITY POLE
UP/SL	UTILITY POLE W/ STREET LIGHT
USACE	U.S. ARMY CORPS OF ENGINEERS
VERT	VERTICAL
W	WATER
W/	WITH
WL	WATERLINE
WM	WATER METER
WV	WATER VALVE

LEGEND

- SD — EXISTING DRAIN LINE
- EXISTING UTILITY POLE
- EXISTING GUY WIRE
- E O/H — EXISTING ELECTRIC LINE
- EXISTING UTILITY POLE/STREET LIGHT
- EXISTING TREE
- EXISTING STUMP
- EXISTING LANDSCAPE ROCKS
- EXISTING TOP OF BANK
- 5 — MAJOR CONTOUR LINE WITH ELEVATION
- 1 — MINOR CONTOUR LINE WITH ELEVATION
- 3.01 — SPOT ELEVATION
- SEWER MANHOLE
- SAN — EXISTING SEWER LINE
- W — EXISTING WATER LINE
- PROPERTY LINE, ℙ
- C/E — EASEMENT
- TRAVERSE LINE
- SURVEY CONTROL
- EXISTING METAL RAILING
- EXISTING CHAIN LINK FENCE
- EXISTING CRM WALL
- EXISTING SIGN
- EXISTING CONCRETE
- EXISTING STRIPING
- EXISTING CONCRETE SURFACE OR PAVEMENT
- C.O.S.A.
- EXIST. CORAL
- TRANSITION PROPOSED DREDGING TO ELEVATION OF EXISTING PHASE 1 DREDGING
- TRANSITION PROPOSED DREDGING AT A 2:1 SLOPE TO ELEVATION OF EXISTING GROUND

INDEX OF DRAWINGS

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G-002	ABBREVIATIONS, LEGEND AND INDEX OF DRAWINGS
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G-104	BENCHMARK MAP AND GENERAL EXISTING CONDITIONS PLAN
G-005	SEWER, HAUL ROUTE AND C.O.S.A. NOTES
BB101	BORING MAP - 1
BB102	BORING MAP - 2
BB003	BORING LOGS
V-101	EXISTING SITE CONDITIONS - KAHAUIKI A
V-102	EXISTING SITE CONDITIONS - KAHAUIKI B
C-101	GENERAL SITE PLAN AND STREAM LAYOUT PLAN
C-102	SITE PLAN - KAHAUIKI A (BASE BID)
C-103	SITE PLAN - KAHAUIKI B (BASE BID)
C-104	DEMOLITION PLAN (BID OPTION 1)
C-105	SITE PLAN - KAHAUIKI B (BID OPTION 1)
C-301	CROSS-SECTIONS 1 - KAHAUIKI A
C-302	CROSS-SECTIONS 2 - KAHAUIKI A
C-303	CROSS-SECTIONS 3 - KAHAUIKI A
C-304	CROSS-SECTIONS 1 - KAHAUIKI B
C-305	CROSS-SECTIONS 2 - KAHAUIKI B
C-306	CROSS-SECTIONS 3 - KAHAUIKI B
CG101	GRADING PLAN (BID OPTION 1)
C-501	CIVIL DETAILS
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CG001	EROSION AND SEDIMENT CONTROL NOTES - 1
CG002	EROSION AND SEDIMENT CONTROL NOTES - 2
CG102	C.O.S.A. LOCATION AND EROSION AND SEDIMENT CONTROL PLAN
CG103	EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI A
CG104	EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI B
CG501	EROSION AND SEDIMENT CONTROL DETAILS - 1
CG502	EROSION AND SEDIMENT CONTROL DETAILS - 2
CT001	TRAFFIC CONTROL NOTES AND DETAIL
CT101	DETOUR PLAN - KAHAUIKI B (BID OPTION 1)
L-001	LANDSCAPE NOTES AND DETAILS
LS101	LANDSCAPE RESTORATION PLAN
S-001	BID OPTION 1: STRUCTURAL GENERAL NOTES
S-101	BRIDGE LAYOUT PLAN
S-301	HEADWALL SECTIONS
S-302	HEADWALL FOUNDATION ELEVATION
S-501	TYPICAL DETAILS (BID OPTION 1)

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

ABBREVIATIONS, LEGEND AND INDEX OF DRAWINGS

SHEET ID
G-002

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND SERVICES TO PROPERLY PERFORM AND FULLY COMPLETE ALL WORK SHOWN ON CONTRACT, DRAWINGS, AND SPECIFICATION.

2. WHEN EXCAVATION IS ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENT, AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS OR UNDERPINNING TO FULLY PROTECT IT FROM DAMAGE.

3. ANY PAVEMENT OUTSIDE THE CONTRACT ZONE LIMITS DAMAGED AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO ITS ORIGINAL, OR BETTER, CONDITION. SUCH RESTORATION SHALL BE TO THE SATISFACTION OF THE CONTRACTING OFFICER, AT CONTRACTOR'S EXPENSE.

4. THE CONTRACTOR SHALL NOTIFY ONE CALL TO VERIFY THE ACTUAL LOCATION OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATING. THE CONTRACTOR SHALL COORDINATE ALL WORK.

5. THE CONTRACTOR SHALL RESTORE, TO THE SATISFACTION OF THE CONTRACTING OFFICER, TO ITS ORIGINAL CONDITION ALL IMPROVEMENTS DAMAGED AS A RESULT OF CONSTRUCTION, INCLUDING PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL.

6. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS/HER SEARCH OF RECORDS OR BY TONING OF THE SURVEYOR ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

7. THE EXISTING IMPROVEMENTS ON THE PREMISES, AND IN ADJACENT AREAS, THAT ARE NOT TO BE REMOVED, SHALL BE PRESERVED AND PROTECTED. ANY AND ALL DAMAGES RESULTING FROM THE CONTRACTOR'S CONSTRUCTION OPERATIONS SHALL BE REPLACED AND REPAIRED TO ORIGINAL CONDITION, TO THE SATISFACTION OF THE CONTRACTING OFFICER AND PAID FOR BY THE CONTRACTOR.

8. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY AT NO COST TO THE GOVERNMENT.

9. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

11. UNLESS RELOCATION IS CALLED FOR ON THE PLANS, EXISTING UTILITIES SHALL REMAIN IN SERVICE AND IN PLACE. IF RELOCATION OF EXISTING UTILITIES IS REQUIRED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE CONTRACTING OFFICER AND THE AFFECTED UTILITY OWNER
    A. CONTRACTOR TO COORDINATE WITH DWP WATER ENGINEERING. (ALLOWABLE MAXIMUM DOWNTIME IS 6 HOURS.)

    B. CONTRACTOR TO COORDINATE WITH AQUA ENGINEERS FOR TEMPORARY BYPASS.

    C. CONTRACTOR TO COORDINATE WITH HECO FOR ELECTRICAL REQUIREMENTS.

12. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, APPURTENANCES AND STRUCTURES SHOWN ARE BASED ON AVAILABLE RECORDS, VERIFIED WHENEVER POSSIBLE BY FIELD SURVEYS. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE LOCATION AND INVERTS OF ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS, AND SHALL PROTECT SUCH UTILITIES AT ALL TIMES. DAMAGE TO EXISTING UTILITIES AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE. INJURY TO PERSONNEL RESULTING FROM CONTACT WITH THE EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND AT NO COST TO THE GOVERNMENT.

13. ALL CONSTRUCTION WORK WITHIN THE ROADWAY SHALL BE DONE BETWEEN THE HOURS OF 8:00 AM TO 3:30 PM, MONDAY THROUGH FRIDAY. CONSTRUCTION WORK MUST BE CLEAR FROM ROADWAY BY 3:30 PM.

14. EXISTING PAVEMENT AND PAVEMENT MARKINGS THAT ARE DAMAGED BY THE CONTRACTOR'S CONSTRUCTION OPERATIONS SHALL BE RESTORED TO THE SATISFACTION OF THE CONTRACTING OFFICER AND PAID FOR BY THE CONTRACTOR.

15. ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS SHALL BE CHECKED AND VERIFIED PRIOR TO THE START OF CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER FOR CLARIFICATION.

16. IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE CONTRACTING OFFICER OR THEIR REPRESENTATIVE, AND THE DIRECTORATE OF PUBLIC WORKS ENVIRONMENTAL DIVISION, CULTURAL RESOURCES SECTION (808) 655-9707.

17. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS". REFER TO SHEET CT001 AND CT101 FOR TRAFFIC CONTROLS.

18. THE CONTRACTOR SHALL APPLY AND PAY FOR ALL NECESSARY CONSTRUCTION PERMITS.

19. THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM DRIVEWAYS AND STREETS AT ALL TIMES.

20. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.

21. ALL WASTE MATERIALS SHALL BE PROMPTLY REMOVED AND DISPOSED OF OUTSIDE THE LIMITS OF THE GOVERNMENT PROPERTY.

GENERAL CONSTRUCTION NOTES (CONT.)

22. THE CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH THE CONTRACTING OFFICER OR HIS OR HER REPRESENTATIVE DURING CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT AT THE BEGINNING OF THE PROJECT AN OVERALL WORK SCHEDULE AND SHALL PROVIDE A 14-DAY WRITTEN NOTICE TO WORK IN ANY AREA.

23. ALL ELECTRICAL AND WATER OUTAGES REQUIRE A PERMIT. REFER TO OUTAGE REQUEST, ATTACHMENTS FOR SECTION 01 50 00 OF THE SPECIFICATIONS.

24. PROTECT IN PLACE ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES TO REMAIN OR THOSE THAT ARE NOT INDICATED TO BE DEMOLISHED AND REMOVED. EXISTING UTILITY SYSTEMS THAT SERVE EXISTING BUILDINGS TO REMAIN SHALL BE PROTECTED IN PLACE AND REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGES TO EXISTING UTILITIES SHALL BE REPAIRED AT NO COST TO THE GOVERNMENT.

25. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS DURING CONSTRUCTION, DEWATERING, AND EXCAVATION TO PREVENT DAMAGE TO EXISTING UTILITIES. THE CONTRACTOR SHALL BE HELD LIABLE IN THE EVENT OF ANY DAMAGE AND HELD RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES NOT SHOWN ON THE DRAWINGS. REPAIR OF DAMAGE TO UTILITIES OR STRUCTURES NOT SHOWN ON THE DRAWINGS SHALL BE REPAIRED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS AND WITH THE CONCURRENCE OF THE CONTRACTING OFFICER OR THEIR DESIGNATED REPRESENTATIVE.

26. U.S. ARMY GARRISON HAWAII (USAG-HI) IDENTIFIED HISTORIC PROPERTIES BENEATH AND IN THE PROJECT AREA. TO AVOID ANY IMPACTS TO CULTURAL RESOURCES, DREDGING AND VEGETATION REMOVAL WILL ONLY REMOVE BUILT-UP SEDIMENTS AND DEBRIS WITH NO ADDITIONAL GROUND DISTURBANCE BENEATH THE CONSTRUCTED CANAL.

27. NPDES PERMITS

    AN NPDES PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES, PER HAR 11-55 APPENDIX C, HAS BEEN OBTAINED FOR THE PROJECT. IF THERE ARE UNFORESEEN CONDITIONS THAT REQUIRE THE PROJECT SCOPE/AREA TO BE REVISED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COR. IF THE CONTRACTOR DESIRES ADDITIONAL AREA FOR A LARGER C.O.S.A., THE CONTRACTOR SHALL COORDINATE WITH THE COR AND DOH AT NO ADDITIONAL COST TO THE GOVERNMENT INCLUDING LABOR, FEES, AND SCHEDULE DELAYS RELATED TO OBTAINING A NEW NPDES PERMIT.

    AN NPDES PERMIT FOR THE DISCHARGE OF GROUNDWATER FROM THE DEWATERING OPERATION INTO THE ADJACENT SYSTEM, PER HAR 11-55 APPENDIX G, HAS BEEN OBTAINED FOR THIS PROJECT.

    A LETTER OF AUTHORIZATION (LOA) WILL NEED TO BE OBTAINED FOR DISCHARGES TO THE INSTALLATION'S PERMITTED STORMWATER SYSTEM. DPW ENVIRONMENTAL CLEAN WATER PROGRAM WILL ISSUE THE LOA UPON REVIEW OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP), THE SUBMITTED NOI C, AND AN INITIAL BMP INSPECTION. THE LOA FOR DISCHARGES COVERED UNDER THE NPDES PERMIT MUST BE SUBMITTED TO THE DOH.

    THIS PROJECT IS COVERED BY THE CURRENT 2024 NPDES GENERAL PERMIT FOR DISCHARGES OF STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES, THE STATE'S GENERAL PERMIT WILL EXPIRE ON JANUARY 29, 2029. IF THE PROJECT HAS NOT REACHED FINAL STABILIZATION AS DEFINED IN THE PERMIT AND CONTRACTOR HAS NOT FILED A NOTICE OF TERMINATION PRIOR TO THE EXPIRATION OF THE GENERAL PERMIT, CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETING AND SUBMITTING A NOTICE OF INTENT (NOI) FOR RENEWAL FOR CONTINUED PROJECT COVERAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE CONTRACTING OFFICER TO OBTAIN REQUIRED SIGNATURES, SUBMITTING FORM(S) TO THE STATE OF HAWAII DEPARTMENT OF HEALTH CLEAN WATER BRANCH AND PAYING THE ASSOCIATED FILING FEE.

    THIS PROJECT IS COVERED BY THE CURRENT 2022 NPDES GENERAL PERMIT FOR DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY DEWATERING, THE STATE'S GENERAL PERMIT WILL EXPIRE ON JANUARY 15, 2027. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETING AND SUBMITTING A NOTICE OF INTENT (NOI) FOR RENEWAL FOR CONTINUED PROJECT COVERAGE, IF THE PROJECT HAS NOT CEASED DEWATERING ACTIVITIES AND HAS NOT FILED A NOTICE OF CESSATION. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE CONTRACTING OFFICER TO OBTAIN REQUIRED SIGNATURES, SUBMITTING FORM(S) TO THE STATE OF HAWAII DEPARTMENT OF HEALTH CLEAN WATER BRANCH AND PAYING THE ASSOCIATED FILING FEE.

TOPOGRAPHIC SURVEY NOTES

1. FOR BENCHMARK SEE BENCHMARK MAP ON SHT. G-104.

2. TOPOGRAPHIC SURVEY OF THE PROJECT SITE WAS PREPARED BY CONTROLPOINT SURVEYING, INC., DATED 03/17/2023.

    HORIZONTAL DATUM: AZIMUTHS AND COORDINATES ARE REFERRED TO HAWAII STATE PLANE NAD 83, ZONE 3, U.S. FEET.

    VERTICAL DATUM:
    NGS "SHAFT BOLT"
    3/4" BRASS PIN
    ELEV.=46.50 FT., MSL (VERSION 8.12.5.14)
    (PID: DN6369)
    (LOWER KAHAUIKI STREAM DREDGING PROJECT PLAN)

    LOCATED APPROXIMATELY 300 FEET FROM THE INTERSECTION OF KAUA STREET AND FUNSTON ROAD HEADING SOUTH TO MOANALUA ROAD.

CONTRACTOR SHALL VERIFY AND ACCEPT ALL EXISTING CONDITIONS PRIOR TO BIDDING & CONSTRUCTION. NOTIFY CONTRACTING OFFICER OF ANY DISCREPANCIES.

PUBLIC HEALTH, SAFETY, AND CONVENIENCE NOTES

1. CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE COUNTY AND STATE SHALL REQUIRE SUPPLEMENTARY MEASURES IF REQUIRED.

3. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

4. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46, PUBLIC HEALTH REGULATIONS, STATE DEPARTMENT OF HEALTH, STATE OF HAWAI`I, "COMMUNITY NOISE CONTROL," IN WHICH MAXIMUM PERMISSIBLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION WORK REQUIRES A PERMIT FROM THE STATE DIRECTOR OF HEALTH, THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR THE CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE FROM THE ENVIRONMENTAL HEALTH SERVICES DIVISION, INDOOR AND RADIOLOGICAL HEALTH BRANCH, NOISE SECTION, 99-945 HALAWA VALLEY STREET, AIEA, HI 96701.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
SIZE: ANSI D
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

GENERAL NOTES

SHEET ID
G-003

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:37 PM

STATE OF HAWAII
TMK: 1-1-064: 025

ROBERT'S TOURS & TRANS
TMK: 1-1-064: 001

MOANALUA STREAM

STATE OF HAWAII
TMK: 1-1-064: 026

UNITED STATES OF AMERICA
TMK: 1-1-035: 002

1599

TMK: 1-1-006: 008

MOKUMOA ST

FUNSTON LOOP

1637

1635

1633

1631

UNITED STATES OF AMERICA
TMK: 1-1-035: 001

FUNSTON RD

SHAFTER
FLATS GATE

KAHAUIKI STREAM A

ANNEX RD

1604

1605

STA. KS-4
1/2" REBAR
ELEV= 10.21'
N 62,762.70
E 1,677,637.87

STREAM RD

KAHAUIKI
STREAM B

BENCHMARK
STA. KS-9
3/4" PIPE
ELEV=5.13
N 62,669.69
E 1,677,883.86

290° 42' 46"
262.99'
(STA. KS-4 TO
STA. KS-9)

301° 20' 02"
259.35'
(STA. KS-9 TO
STA. KS-10)

SHEET V-102

LOOP RD

STA. KS-10
1/2" PIPE
ELEV=4.56
N 62,534.82
E 1,678,105.39

STA. KS-6
1/2" REBAR
ELEV=6.65
N 62,100.48
E 1,677,296.59

SHAFTER FLATS TRACK

207° 15' 54"
744.99'
(STA. KS-6 TO
STA. KS-4)

HAWAIIAN ELECTRIC
COMPANY LTD.
EASEMENT FOR ELECTRIC
TRANSMISSION LINE

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-006: 004

SHEET V-101

BENCHMARK
STA. KS-8
1/2" REBAR
ELEV=5.18
N 61,799.41
E 1,676,751.29
(RECORD)

STA. KS-7
1/2" REBAR
ELEV=5.68
N 61,912.97
E 1,676,989.23

238° 36' 52"
360.05'
(STA. KS-7 TO
STA. KS-6)

HAWAIIAN ELECTRIC COMPANY LTD.
EASEMENT FOR ELECTRIC TRANSMISSION LINE

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-008: 001

STATE OF HAWAII
TMK: 1-1-064: 002

1586

1583

1582

1585

1584

1585X

244° 29' 07"
263.65'
(STA. KS-8 TO
STA. KS-7)

KEEHI
TRANSFER
STATION

ANNEX RD

TAKATA RD

1535

1528

1537

1578

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-006: 001

1587

STATE OF HAWAII
TMK: 1-1-006: 013

PLAN
NORTH
TRUE N

A1 BENCHMARK MAP AND GENERAL EXISTING CONDITIONS PLAN

SCALE: 1" = 80'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

BENCHMARK MAP AND GENERAL
EXISTING CONDITIONS PLAN

SHEET ID
G-104

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:37 PM

SEWER NOTES

1. AQUA ENGINEERS,INC. (AQUA) OPERATES AND MAINTAINS THE SEWER SYSTEM WITHIN THE PROJECT AREA.

2. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY AQUA ENGINEERS, INC. AT (808) 694-3105 IF ANY SEWER LINES (INCLUDING ABANDONED LINES) ARE UNCOVERED OR DAMAGED DURING EXCAVATION.

3. CONTRACTOR SHALL COMPLY WITH AQUA'S MANUAL FOR ARMY PROJECT SERVICES RELATED TO WASTEWATER, DATED AUGUST 2019.

4. PROPOSED STRUCTURES SHALL MAINTAIN A MINIMUM 5 FEET HORIZONTAL CLEARANCE FROM EXISTING AND PROPOSED SEWER UTILITIES (E.G., SEWER LINES, MANHOLES, CLEANOUTS, VAULTS, ETC.). IF CLEARANCE CANNOT BE MAINTAINED, CONTACT AQUA AT (808) 694-3105 FOR FURTHER COORDINATION.

5. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING SEWER UTILITIES WITHIN THE PROJECT AREA PRIOR TO ANY WORK.

6. IN THE EVENT OF A WASTEWATER SPILL, CONTRACTOR SHALL IMMEDIATELY NOTIFY AQUA ENGINEERS, INC. AND THE ARMY DIRECTORATE OF PUBLIC WORKS AS INDICATED BELOW:

   A. AQUA ENGINEERS, INC. 24 HOUR EMERGENCY PHONE NUMBERS
      I. (808) 685-7347 -- FOR PROJECTS LOCATED ON FORT SHAFTER, TRIPLER ARMY MEDICAL CENTER, ALIAMANU MILITARY RESERVATION, FORT DERUSSY, THE PILILAAU ARMY RECREATION CENTER, AND SCHOFIELD EAST RANGE (SOUTHWEST PORTION BETWEEN THE WAHIAWA RESERVOIR AND HIGGINS ROAD ONLY)

   B. EMAIL AQUA AT PROJECTSERVICES@AQUAENGINEERS.COM.

   C. ARMY DIRECTORATE OF PUBLIC WORKS (DPW)

      I. DEAN MIYAMOTO, DPW WASTEWATER UTILITIES COR -- (808) 656-3026

      II. MICHELLE OGMAN, CLEAN WATER PROGRAM -- (808) 656-3316

7. CONTRACTOR SHALL IMMEDIATELY NOTIFY AQUA ENGINEERS, INC. AT (808) 694-3105 OF ANY DAMAGED SEWER UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING SEWER UTILITIES CAUSED BY THE CONTRACTOR OR ANY OF ITS SUBCONTRACTORS AND SHALL IMMEDIATELY REPAIR THE DAMAGED UTILITIES AT NO COST TO THE ARMY OR AQUA. SHOULD AQUA REPAIR THE DAMAGE UTILITIES, CONTRACTOR SHALL REIMBURSE AQUA FOR THE REPAIR WORK.

8. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION AND SHALL PAY FOR ANY COSTS, FINES, OR PENALTIES ASSOCIATED WITH ANY SEWAGE SPILL RESULTING FROM THE WORK AT NO COST TO THE ARMY OR AQUA. CONTRACTOR SHALL REMEDIATE ANY SEWAGE SPILLS AS SOON AS POSSIBLE.

9. CONTRACTOR SHALL BE RESPONSIBLE AND LIABLE FOR ALL WORK, INCLUDING ANY SEWAGE SPILLS, BYPASSES, OVERSIGHTS, DAMAGES, ERRORS, OR OMISSIONS CAUSED BY THE CONTRACTOR OR ANY OF ITS SUBCONTRACTORS.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.

11. ALL PERMITS, REQUESTS FOR INSPECTION, OR ANY OTHER SUBMITTALS SHALL BE SUBMITTED TO PROJECTSERVICES@AQUAENGINEERS.COM.

12. UPON COMPLETION OF THE WORK, SEWER MANHOLE COVERS SHALL BE FLUSH WITH THE SURROUNDING ELEVATION AND FREE OF ANY ASPHALT OR MATERIAL BUILDUP.

HAUL ROUTE NOTES

1. HAUL ROUTE SHOWN IS PROJECTED AND MAY CHANGE DURING THE PROJECT CONSTRUCTION DUE TO OTHER CONSTRUCTION PROJECTS AND BASE ACTIVITIES.

2. COORDINATE WITH COR FOR HAUL ROUTE AT THE START OF CONSTRUCTION AND DURING THE CONSTRUCTION DURATION.

3. SEE SHEET G-001 COVER SHEET FOR HAUL ROUTE MAP.

4. ALL AREAS DISTURBED BY THE CONSTRUCTION CONTRACTOR, INCLUDING THE HAUL ROUTES AND AREAS THAT ARE WITHIN THE PROJECT LIMITS, MUST BE RESTORED (TO EQUAL OR BETTER) AT NO COST TO THE GOVERNMENT.

5. PROTECT IN PLACE ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES TO REMAIN OR THAT ARE NOT INDICATED TO BE DEMOLISHED AND REMOVED. EXISTING UTILITY SYSTEMS THAT SERVE EXISTING BUILDINGS TO REMAIN SHALL BE PROTECTED IN PLACE AND REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGES TO EXISTING UTILITIES SHALL BE REPAIRED AT NO COST TO THE GOVERNMENT.

6. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS DURING CONSTRUCTION, DEWATERING, AND EXCAVATION TO PREVENT DAMAGE TO EXISTING UTILITIES. THE CONTRACTOR SHALL BE HELD LIABLE IN THE EVENT OF ANY DAMAGE AND HELD RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES NOT SHOWN ON THE DRAWINGS. REPAIR OF DAMAGE TO UTILITIES OR STRUCTURES NOT SHOWN ON THE DRAWINGS SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE GOVERNMENT AND IN ACCORDANCE WITH THE SPECIFICATIONS AND WITH THE CONCURRENCE OF THE CONTRACTING OFFICER OR THEIR DESIGNATED REPRESENTATIVE.

CONTRACTOR'S OPERATIONS OR STORAGE AREA (C.O.S.A.) NOTES

1. AN OPEN OPERATIONS OR STORAGE AREA WILL BE MADE AVAILABLE WITHIN THE INSTALLATION AS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY NECESSARY FOR PROTECTION OF HIS/HER EQUIPMENT AND MATERIALS AND SHALL MAINTAIN THE AREA FREE OF DEBRIS. NO RUSTY OR UNSIGHTLY MATERIALS SHALL BE USED FOR PROVIDING THE SECURE MEASURE AND SUCH SHALL BE ERECTED IN A WORKMANLIKE MANNER. GOVERNMENT WILL NOT BE LIABLE FOR ANY DAMAGED OR STOLEN EQUIPMENT LOCATED WITHIN THE C.O.S.A SITE. BEFORE ANY CONSTRUCTION COMMENCES ON ESTABLISHING THE OPERATIONS/STORAGE AREA, CONTRACTOR SHALL TAKE PHOTOGRAPHS AND/OR VIDEOS OF THE SITE IN ORDER TO ESTABLISH THE ORIGINAL CONDITIONS OF THE SITE. A DUPLICATE SET OF THESE PHOTOGRAPHS AND/OR VIDEOS SHALL BE MADE AVAILABLE AND SUBMITTED TO THE GOVERNMENT FOR ITS FILES. UPON COMPLETION AND PRIOR TO THE FINAL ACCEPTANCE OF THE CONTRACT WORK, THE CONTRACTOR SHALL RESTORE THE AREA TO ITS ORIGINAL CONDITION. CONTACT DPW MASTER PLANNING FOR C.O.S.A. COORDINATION, EUGENE NAM AT EUGENE.Y.NAM.CIV@ARMY.MIL, (808) 656-3292 OR JASON ABAYON AT JASON.A.ABAYON.CIV@ARMY.MIL.

2. CONTRACTOR'S OPERATIONS AND STORAGE AREA (C.O.S.A.) SHALL BE LOCATED AS INDICATED ON THE PLANS AND COORDINATED WITH THE COR. C.O.S.A. SHALL BE RESTORED TO ITS ORIGINAL CONDITION AFTER PROJECT COMPLETION. PROVIDE A MINIMUM 6-FT. 6-FT HIGH TEMPORARY DUST/SECURITY FENCE AROUND THE C.O.S.A., AS DIRECTED BY THE COR, WITH A SIGN POSTED SHOWING CONTRACTOR'S NAME, POINT OF CONTACT (POC), AND PHONE NUMBER FOR POC (24 HOURS/DAY), IN CASE OF AN EMERGENCY DURING OFF-HOURS. THE ARMY WILL NOT BE LIABLE FOR ANY DAMAGED OR STOLEN EQUIPMENT LOCATED WITHIN THE C.O.S.A. LIMITS.

3. CONTRACTOR PARKING

   IF THE CONTRACTOR DESIRES ADDITIONAL PARKING FOR THEIR PERSONNEL'S PRIVATELY OWNED VEHICLES (POV) OUTSIDE OF THE DESIGNATED C.O.S.A., THE CONTRACTOR SHALL COORDINATE ADDITIONAL OFF-SITE PARKING WITH THE COR. THE CONTRACTOR SHALL PROVIDE SHUTTLE SERVICE BETWEEN THE ADDITIONAL POV PARKING AREAS AND THE PROJECT SITE AT THE CONTRACTOR'S EXPENSE.

   IF THE ADDITIONAL PARKING AREAS PROVIDED TO THE CONTRACTOR ARE NOT EXISTING PARKING AREAS (E.G. UNIMPROVED DIRT OR GRASSED AREAS), THE CONTRACTOR SHALL COORDINATE WITH DPW ENVIRONMENTAL CLEAN WATER PROGRAM FOR LOCATION AND THE COR TO OBTAIN A NEW NPDES PERMIT TO INCLUDE THESE ADDITIONAL PARKING AREAS AS PART OF THE TOTAL DISTURBED AREA AT NO ADDITIONAL COST TO THE GOVERNMENT INCLUDING LABOR, FEES, AND SCHEDULE DELAYS RELATED TO REVISING THE PERMIT.

   USARHAW REG 190-5 PROHIBITS VEHICLES (BOTH CONSTRUCTION AND PERSONAL) FROM PARKING ON GRASSED OR SEEDED AREAS. ALL PARKING ASSOCIATED WITH THIS PROJECT (DURING AND POST CONSTRUCTION) WILL BE ONLY IN DESIGNATED AND MARKED PARKING AREAS (I.E. STRIPED PARKING STALLS). THE PROJECT PROPONENT AND/OR THEIR DESIGNATED ORGANIZATION WILL BE RESPONSIBLE FOR ENFORCEMENT.

4. PRIOR TO CONSTRUCTION, COORDINATE AND VERIFY C.O.S.A. LOCATIONS AND AVAILABILITY WITH COR AND DPW MASTER PLANNING DIVISION. PREPARE AND SUBMIT C.O.S.A. APPLICATION FOR APPROVAL.

5. INSTALL PERIMETER PROTECTION AS SHOWN ON SHEETS CG102, CG103, AND CG104.

6. THE CONTRACTOR SHALL PROVIDE A STABILIZED CONSTRUCTION ENTRANCE WHERE VEHICLES WILL BE TRAVELING FROM UNPAVED TO PAVED SURFACES AND VICE VERSA.

7. IT IS ANTICIPATED THAT MOST OF THE WORK WILL BE DONE WITH FUEL DRIVEN EQUIPMENT. IF POWER IS REQUIRED BY THE CONTRACTOR, A GENERATOR COULD BE EMPLOYED. IF THE CONTRACTOR CHOOSES TO USE HECO POWER, THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT HECO TO PROVIDE SERVICE FOR THE C.O.S.A., AND SHALL BE RESPONSIBLE FOR THE ASSOCIATED SERVICES CHARGES. REFER TO ENCLOSURE 6 - ELECTRICAL SERVICE REQUEST FLOW CHART IN SECTION 01 50 00 OF THE SPECIFICATIONS.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

SEWER, HAUL ROUTE AND C.O.S.A. NOTES

SHEET ID
G-005

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:37 PM

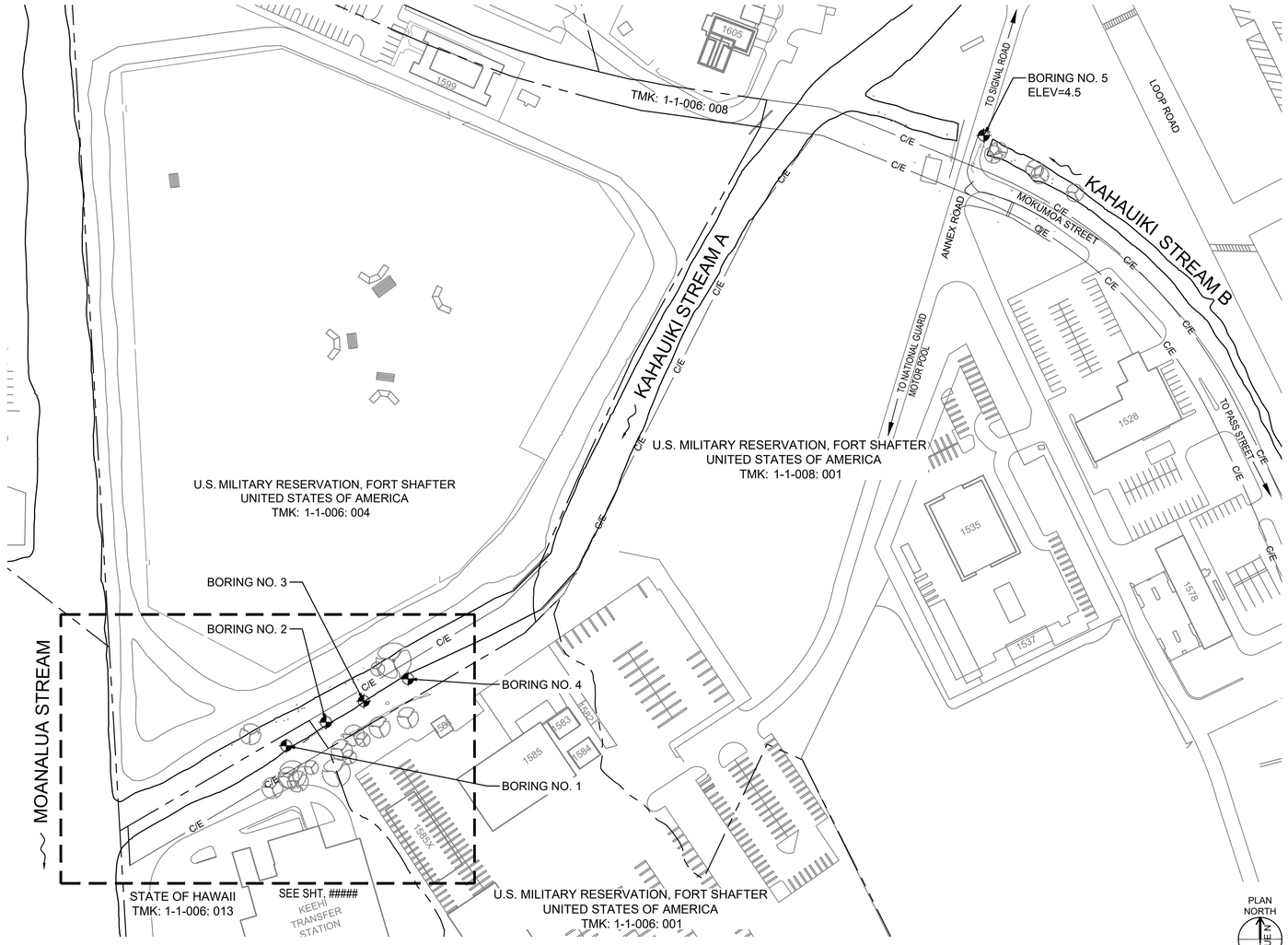
GEOTECHNICAL NOTES:

1. A GEOTECHNICAL ENGINEERING REPORT ENTITLED "GEOTECHNICAL ENGINEERING EXPLORATION, KAHAUIKI STREAM MAINTENANCE, PHASE 2, FORT SHAFTER FLATS, HONOLULU, OAHU, HAWAII" DATED DECEMBER 13, 2023 HAS BEEN PREPARED BY KOKUA GEOTECH LLC.

2. FOR BORING LOCATIONS, SEE SHT. BB102.

3. THE LOGS OF BORINGS INDICATE THE SUBSURFACE AND GROUNDWATER CONDITIONS ENCOUNTERED ONLY AT THE LOCATIONS WHERE THE BORINGS WERE DRILLED AND AT THE TIMES DESIGNATED ON THE LOGS, AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS OR AT OTHER TIMES. SUBSURFACE AND GROUNDWATER CONDITIONS MAY DIFFER FROM THE LOGS DUE TO THE PASSAGE OF TIME, IMPROVEMENTS CONSTRUCTED AT THE SITE, CHANGES IN SURFACE DRAINAGE AND IRRIGATION PATTERNS, AND OTHER CHANGES.

4. THE PENETRATION RESISTANCE SHOWN ON THE LOGS OF BORINGS INDICATE THE NUMBER OF BLOWS REQUIRED FOR THE SPECIFIC SAMPLER TYPE USED. THE BLOW COUNTS MAY NEED TO BE FACTORED TO OBTAIN THE STANDARD PENETRATION TEST (SPT) BLOW COUNTS.



A1 BORING MAP - 1

SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

BORING MAP - 1

SHEET ID

BB101

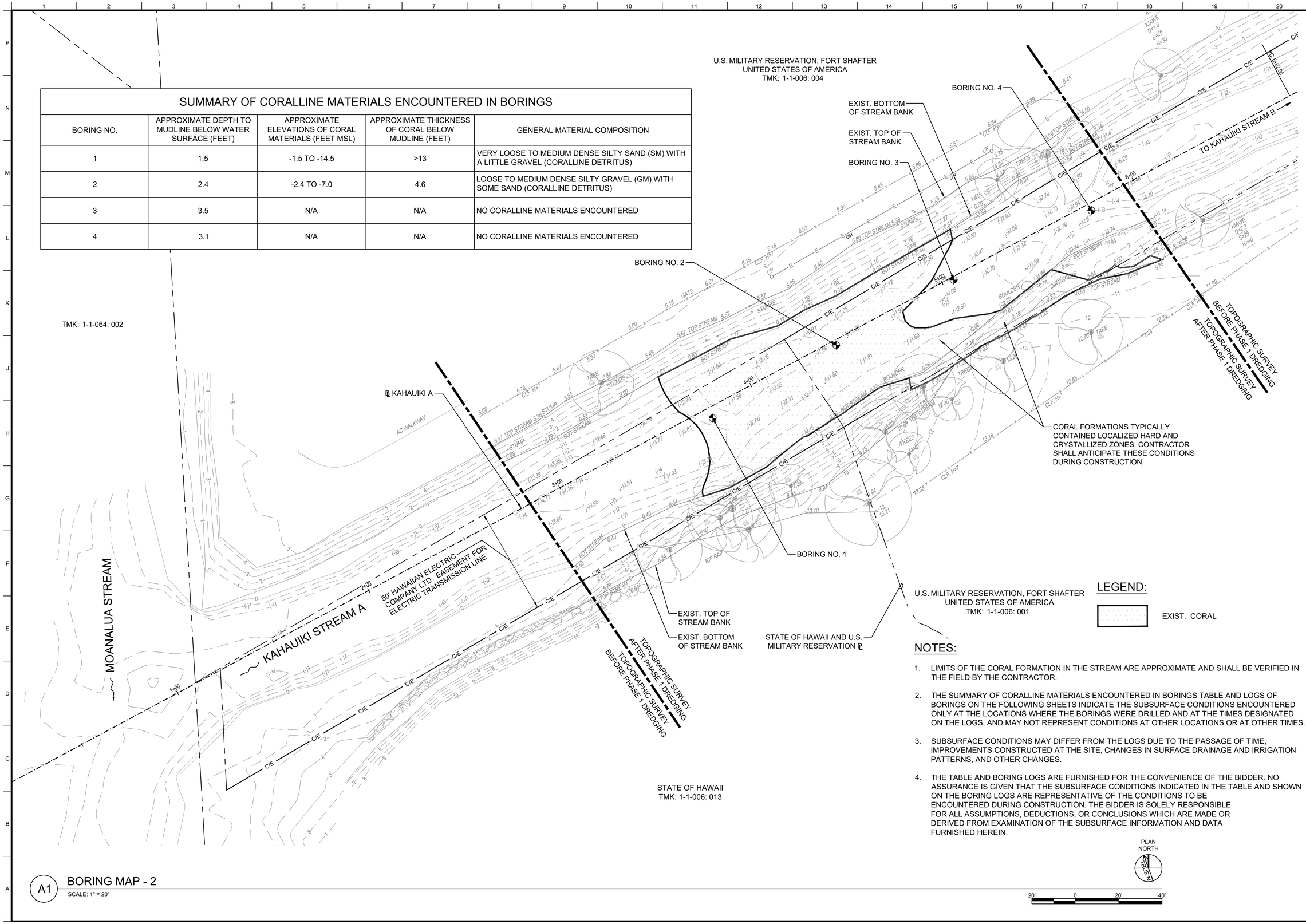
RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:37 PM

SUMMARY OF CORALLINE MATERIALS ENCOUNTERED IN BORINGS

BORING NO.	APPROXIMATE DEPTH TO MUDLINE BELOW WATER SURFACE (FEET)	APPROXIMATE ELEVATIONS OF CORAL MATERIALS (FEET MSL)	APPROXIMATE THICKNESS OF CORAL BELOW MUDLINE (FEET)	GENERAL MATERIAL COMPOSITION
1	1.5	-1.5 TO -14.5	>13	VERY LOOSE TO MEDIUM DENSE SILTY SAND (SM) WITH A LITTLE GRAVEL (CORALLINE DETRITUS)
2	2.4	-2.4 TO -7.0	4.6	LOOSE TO MEDIUM DENSE SILTY GRAVEL (GM) WITH SOME SAND (CORALLINE DETRITUS)
3	3.5	N/A	N/A	NO CORALLINE MATERIALS ENCOUNTERED
4	3.1	N/A	N/A	NO CORALLINE MATERIALS ENCOUNTERED



NOTES:

1. LIMITS OF THE CORAL FORMATION IN THE STREAM ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
2. THE SUMMARY OF CORALLINE MATERIALS ENCOUNTERED IN BORINGS TABLE AND LOGS OF BORINGS ON THE FOLLOWING SHEETS INDICATE THE SUBSURFACE CONDITIONS ENCOUNTERED ONLY AT THE LOCATIONS WHERE THE BORINGS WERE DRILLED AND AT THE TIMES DESIGNATED ON THE LOGS, AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS OR AT OTHER TIMES.
3. SUBSURFACE CONDITIONS MAY DIFFER FROM THE LOGS DUE TO THE PASSAGE OF TIME, IMPROVEMENTS CONSTRUCTED AT THE SITE, CHANGES IN SURFACE DRAINAGE AND IRRIGATION PATTERNS, AND OTHER CHANGES.
4. THE TABLE AND BORING LOGS ARE FURNISHED FOR THE CONVENIENCE OF THE BIDDER. NO ASSURANCE IS GIVEN THAT THE SUBSURFACE CONDITIONS INDICATED IN THE TABLE AND SHOWN ON THE BORING LOGS ARE REPRESENTATIVE OF THE CONDITIONS TO BE ENCOUNTERED DURING CONSTRUCTION. THE BIDDER IS SOLELY RESPONSIBLE FOR ALL ASSUMPTIONS, DEDUCTIONS, OR CONCLUSIONS WHICH ARE MADE OR DERIVED FROM EXAMINATION OF THE SUBSURFACE INFORMATION AND DATA FURNISHED HEREIN.

A1 BORING MAP - 2
SCALE: 1" = 20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
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RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

BORING MAP - 2

SHEET ID
BB102

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:38 PM

Project: Kahauiki Stream Maintenance Dredging, Ph. 2	**Kokua Geotech LLC**	Key to Logs of Borings
Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii	94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Sheet 1 of 1
Project Number: 082922-00		

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Core Recovery, %	RQD, %	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
1	2	3	4	5	6	7	8	9	10	11	12	13	14

COLUMN DESCRIPTIONS

1 Elevation (feet): Elevation (MSL, feet).
2 Depth (feet): Depth in feet below the ground surface.
3 Sample Type: Type of soil sample collected at the depth interval shown.
4 Sample Number: Sample identification number.
5 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
6 Core Recovery, %: , expressed as the amount of recovered material divided by the total length of the core run (presented as a percentage).
7 RQD, %: , expressed as a modified core recovery in which the lengths of all sound rock core piece over 4 inches in length are summed and divided by the length of the core run.
8 U.S.C.S: Type of material encountered.
9 Graphic Log: Graphic depiction of the subsurface material encountered.
10 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
11 Pocket Pen./Torvane, tsf: the reading from Poecket Penetrometer or Torvane.
12 Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
13 Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
14 Remarks and Other Tests: Other Tests

FIELD AND LABORATORY TEST ABBREVIATIONS

CORR: Corrosivisty tests to assess soil corrosivity
WOR: Weight of Rods
WOH: Weight of Hammer
CONS: One-dimensional consolidation test

LL: Liquid Limit, percent
PI: Plasticity Index, percent
SPT: Standard Penetration Test
UC: Unconfined Compression
MCS: Modified California Sampler

MATERIAL GRAPHIC SYMBOLS

Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
Silty GRAVEL (GM)
Clayey SAND (SC)
Silty SAND (SM)
Water

TYPICAL SAMPLER GRAPHIC SYMBOLS

Auger sampler
Bulk Sample
3-inch-OD California w/ brass rings
CME Sampler
Grab Sample
HQ Coring
3-inch OD Modified California w/ brass liners
Pitcher Sample
PQ Coring
Probing w/Pointed Tip
2-inch-OD unlined split spoon (SPT)
Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

Water level (at time of drilling, ATD)
Water level (after waiting)
Minor change in material properties within a stratum
Inferred/gradational contact between strata
Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

PLATE A-0.1

Project: Kahauiki Stream Maintenance Dredging, Ph. 2	**Kokua Geotech LLC**	Log of Boring No. 1
Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii	94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Sheet 1 of 1
Project Number: 082922-00		

Date(s) Drilled: 6/28/23	Logged By: AJF	Checked By: AJF
Drilling Method: HQ Coring	Drill Bit Size/Type: HQ-Size Coring	Total Depth of Borehole: 14.5 feet
Drill Rig Type: Lonestar Track Drill	Drilling Contractor: Kokua Geotech LLC	Approximate Surface Elevation: +0 feet MSL (Mudline -1.5 feet)
Groundwater Level and Date Measured: N/A	Sampling Method(s): MCS, SPT & HQ-Coring	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: N/A	Location: See Site Plan - 1 (Plate 2.1)	

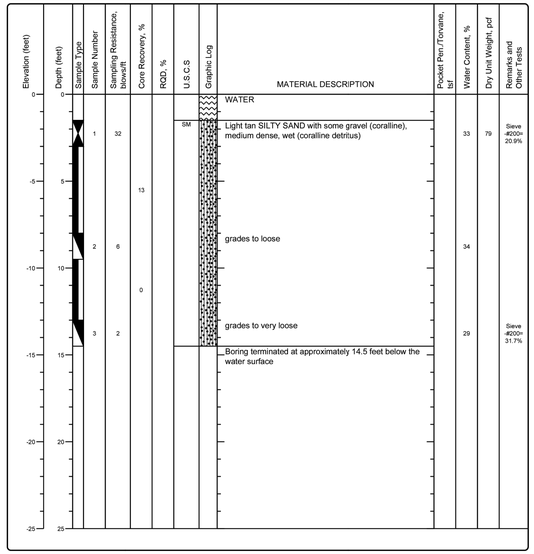


PLATE A-1

Project: Kahauiki Stream Maintenance Dredging, Ph. 2	**Kokua Geotech LLC**	Log of Boring No. 2
Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii	94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Sheet 1 of 1
Project Number: 082922-00		

Date(s) Drilled: 6/28/23	Logged By: AJF	Checked By: AJF
Drilling Method: HQ Coring	Drill Bit Size/Type: HQ-Size Coring	Total Depth of Borehole: 10.0 feet
Drill Rig Type: Lonestar Track Drill	Drilling Contractor: Kokua Geotech LLC	Approximate Surface Elevation: +0 feet MSL (Mudline -2.4 feet)
Groundwater Level and Date Measured: N/A	Sampling Method(s): MCS, SPT & HQ-Coring	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: N/A	Location: See Site Plan - 1 (Plate 2.1)	

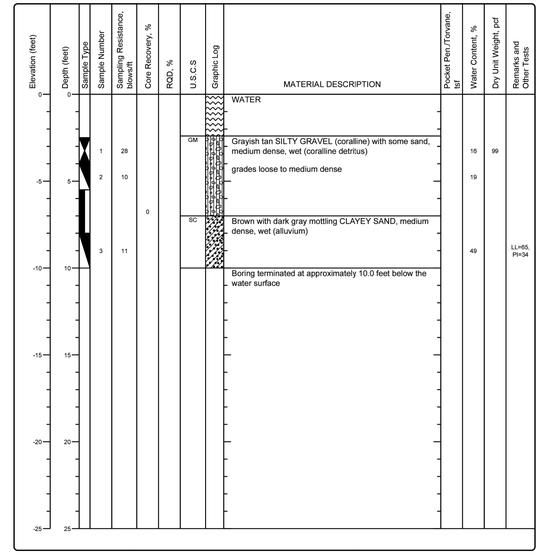


PLATE A-2

Project: Kahauiki Stream Maintenance Dredging, Ph. 2	**Kokua Geotech LLC**	Log of Boring No. 3
Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii	94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Sheet 1 of 1
Project Number: 082922-00		

Date(s) Drilled: 6/29/23	Logged By: AJF	Checked By: AJF
Drilling Method: HQ Coring	Drill Bit Size/Type: HQ-Size Coring	Total Depth of Borehole: 10.5 feet
Drill Rig Type: Lonestar Track Drill	Drilling Contractor: Kokua Geotech LLC	Approximate Surface Elevation: +0 feet MSL (Mudline -3.5 feet)
Groundwater Level and Date Measured: N/A	Sampling Method(s): MCS, SPT & HQ-Coring	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: N/A	Location: See Site Plan - 1 (Plate 2.1)	

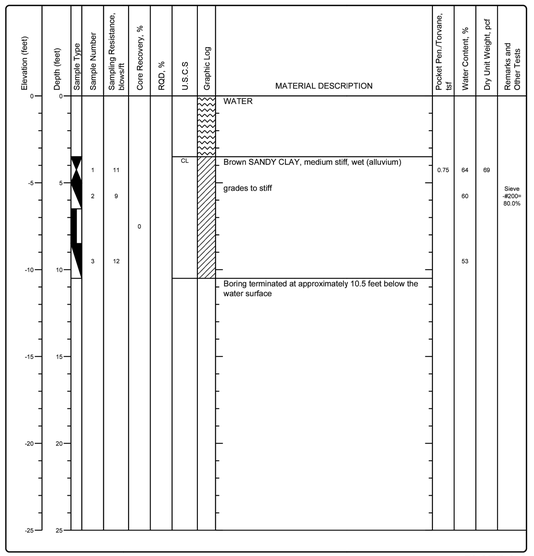


PLATE A-3

Project: Kahauiki Stream Maintenance Dredging, Ph. 2	**Kokua Geotech LLC**	Log of Boring No. 4
Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii	94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Sheet 1 of 1
Project Number: 082922-00		

Date(s) Drilled: 6/29/23	Logged By: AJF	Checked By: AJF
Drilling Method: HQ Coring	Drill Bit Size/Type: HQ-Size Coring	Total Depth of Borehole: 10.0 feet
Drill Rig Type: Lonestar Track Drill	Drilling Contractor: Kokua Geotech LLC	Approximate Surface Elevation: +0 feet MSL (Mudline -3.1 feet)
Groundwater Level and Date Measured: N/A	Sampling Method(s): MCS, SPT & HQ-Coring	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: N/A	Location: See Site Plan - 1 (Plate 2.1)	

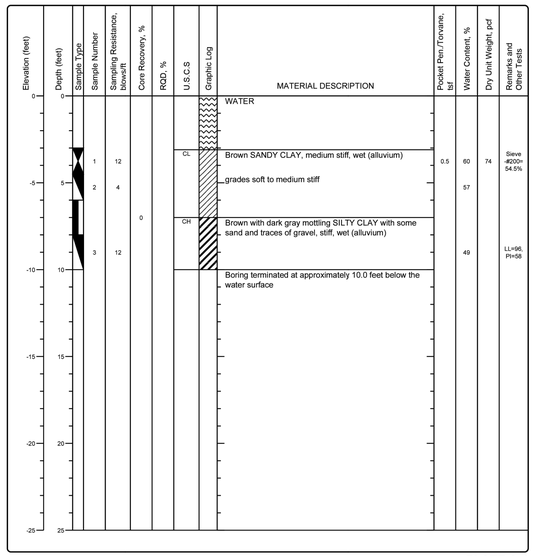


PLATE A-4

Project: Kahauiki Stream Maintenance Dredging, Ph. 2	**Kokua Geotech LLC**	Log of Boring No. 5
Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii	94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Sheet 1 of 1
Project Number: 082922-00		

Date(s) Drilled: 2/10/23	Logged By: JW	Checked By: AJF
Drilling Method: CF Auger	Drill Bit Size/Type: 6-inch Hollow Stem Auger	Total Depth of Borehole: 21.5 feet
Drill Rig Type: Diedrich D-25	Drilling Contractor: Kokua Geotech LLC	Approximate Surface Elevation: +4.5 feet MSL*
Groundwater Level and Date Measured: 5.0 feet @ 11:04 AM 2/10/23	Sampling Method(s): MCS & SPT	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: Soil Cuttings and Gravel	Location: See Site Plan - 2 (Plate 2.2)	

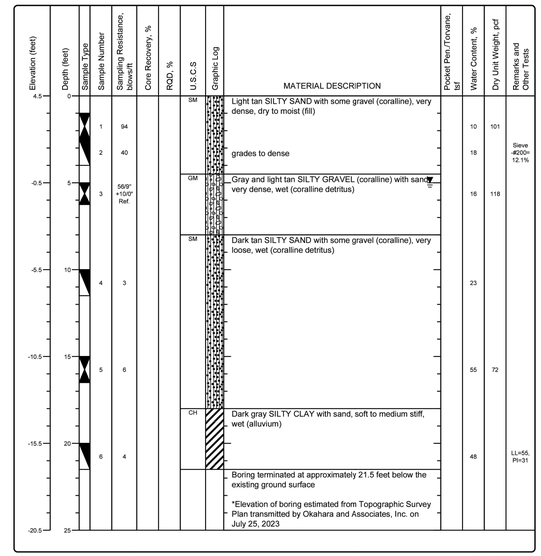


PLATE A-5

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
B. AKEDO	TBD
DRAWN BY:	SOLICITATION NO.:
S. CARREIRA-PUAHALA	TBD
CHECKED BY:	CONTRACT NO.:
M. FUJIOKA	TBD
SUBMITTED BY:	
M. FUJIOKA	
SIZE:	RTA SUBMITTAL
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

BORING LOGS

SHEET ID
BB003

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:38 PM

SURVEY CONTROLS:

HORIZONTAL:
AZIMUTHS AND COORDINATES REFERRED TO
HAWAII STATE PLANE, NAD 83, ZONE 3, U.S. FEET.

VERTICAL:
NGS "SHAFT BOLT"
3/4" BRASS PIN
ELEV=46.50 FT., MSL (VERSION 8.12.5.14)
(PID: DN6369)
(LOWER KAHAUIKI STREAM DREDGING PROJECT PLAN)

LOCATED 300 FT FROM THE INTERSECTION
OF KAUA STREET AND FUNSTON ROAD
HEADING SOUTH TO MOANALUA ROAD.

LEGEND:

- CHAIN LINK FENCE
- RAILING
- CRM WALL/RIP-RAP
- PROPERTY LINE
- EASEMENT

TREES (D=DIAMETER, H=HEIGHT, MEASURED IN FEET)
(APPROXIMATE DRIP LINE AS SHOWN)
(NO SPECIFIC SPECIES)

TREE

UNDERGROUND UTILITY LEGEND

MAP SYMBOL	UTIL. TYPE	CADD LAYER	VERIFICATION CLASS A	B	C	D
W W W	WATER	V-WATR-MAIN-PIPE	☐	☐	☐	■
SAN SAN	SEWER	V-SSWR-MAIN-PIPE	☐	☐	☐	■
SD SD	DRAIN	V-STRM-MAIN-PIPE	☐	☐	☐	■
E E O/H E E	ELEC OVERHEAD	V-PRIM-OVHD	☐	☐	■	☐

VERIFICATION CLASS
A = EXCAVATED AND LOCATED
B = TONE LOCATION
C = OBSERVED LIMITED TO FIELD CONDITION
D = PER RECORD PLANS

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-006: 004

STA. KS-7
1/2" REBAR
ELEV=5.68
N 61,912.97
E 1,676,989.23

STA. KS-8
1/2" REBAR
ELEV=5.18
N 61,799.41
E 1,676,751.29

EXIST. OVERHEAD TRANSMISSION LINE

EXIST. CHAIN LINK FENCE

EXIST. GATE

EXIST. BOTTOM OF STREAM BANK

EXIST. TOP OF STREAM BANK

263° 65" (STA. KS-8 TO STA. KS-7)

244° 29' 07"

238° 36' 52"

360.05' (STA. KS-7 TO STA. KS-6)

50' HAWAIIAN ELECTRIC COMPANY LTD. EASEMENT FOR ELECTRIC TRANSMISSION LINE

KAHAUIKI STREAM A

TO KAHAUIKI STREAM B

TO MOANALUA STREAM

TOPOGRAPHIC SURVEY BEFORE PHASE 1 DREDGING

TOPOGRAPHIC SURVEY AFTER PHASE 1 DREDGING

1586

EXIST. BOTTOM OF STREAM BANK

EXIST. TOP OF STREAM BANK

EXIST. CHAIN LINK FENCE, PROTECT IN PLACE

EXIST. RIP-RAP. PROTECT IN PLACE

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-006: 001

STATE OF HAWAII
TMK: 1-1-006: 013

STATE OF HAWAII AND U.S. MILITARY RESERVATION ℄

HAWAIIAN ELECTRIC COMPANY LTD. EASEMENT LINE.

NOTES:

1. EXISTING CONDITIONS ARE BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY CONTROLPOINT SURVEYING AND FROM RECORD DRAWINGS AND ARE NOT GUARANTEED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO COMMENCING WITH THE WORK.
2. UNLESS OTHERWISE NOTED, ALL LOCATIONS OF UNDERGROUND UTILITY LINES AND/OR STRUCTURES ARE APPROXIMATE. NO GUARANTEE IS MADE ON THE ACCURACY OF COMPLETENESS OF THE INFORMATION SHOWN. THE USER(S) OF THIS TOPOGRAPHIC SURVEY MAP SHALL VERIFY THE INFORMATION, AS NEEDED, DURING CONSTRUCTION.
3. CALLOUTS ON THIS SHEET ARE PROVIDED FOR CONTRACTOR CONVENIENCE AND MAY NOT IDENTIFY ALL EXISTING CONDITIONS THAT MAY BE IMPACTED BY THE WORK.
4. SEE SHEETS G-002 FOR ABBREVIATIONS, LEGEND AND INDEX OF DRAWINGS AND G-003 FOR TOPOGRAPHIC SURVEY NOTES.
5. SEE SHEETS CG001 FOR EROSION AND SEDIMENT CONTROL NOTES - 1, CG103 FOR EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI A, CG104 FOR EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI B AND CG501 AND CG502 FOR EROSION AND SEDIMENT CONTROL DETAILS.

PLAN NORTH (TRUE N)

20' 0 20' 40'

A1 EXISTING SITE CONDITIONS - KAHAUIKI A
SCALE: 1" = 20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIGNED: ANSLD
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

EXISTING SITE CONDITIONS - KAHAUIKI A

SHEET ID
V-101

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: SCARREIRA
PLOTTED: 5/15/2025 4:38 PM

SURVEY CONTROLS:

HORIZONTAL:
AZIMUTHS AND COORDINATES REFERRED TO
HAWAII STATE PLANE, NAD 83, ZONE 3, U.S. FEET.

VERTICAL:
NGS "SHAFT BOLT"
3/4" BRASS PIN
ELEV=46.50 FT., MSL (VERSION 8.12.5.14)
(PID: DN6369)
(LOWER KAHAUIKI STREAM DREDGING PROJECT PLAN)

LOCATED 300 FT FROM THE INTERSECTION
OF KAUA STREET AND FUNSTON ROAD
HEADING SOUTH TO MOANALUA ROAD.

LEGEND:

- CHAIN LINK FENCE
- RAILING
- CRM WALL/RIP-RAP
- PROPERTY LINE
- EASEMENT

TREES (D=DIAMETER, H=HEIGHT, MEASURED IN FEET)
(APPROXIMATE DRIP LINE AS SHOWN)
(NO SPECIFIC SPECIES)

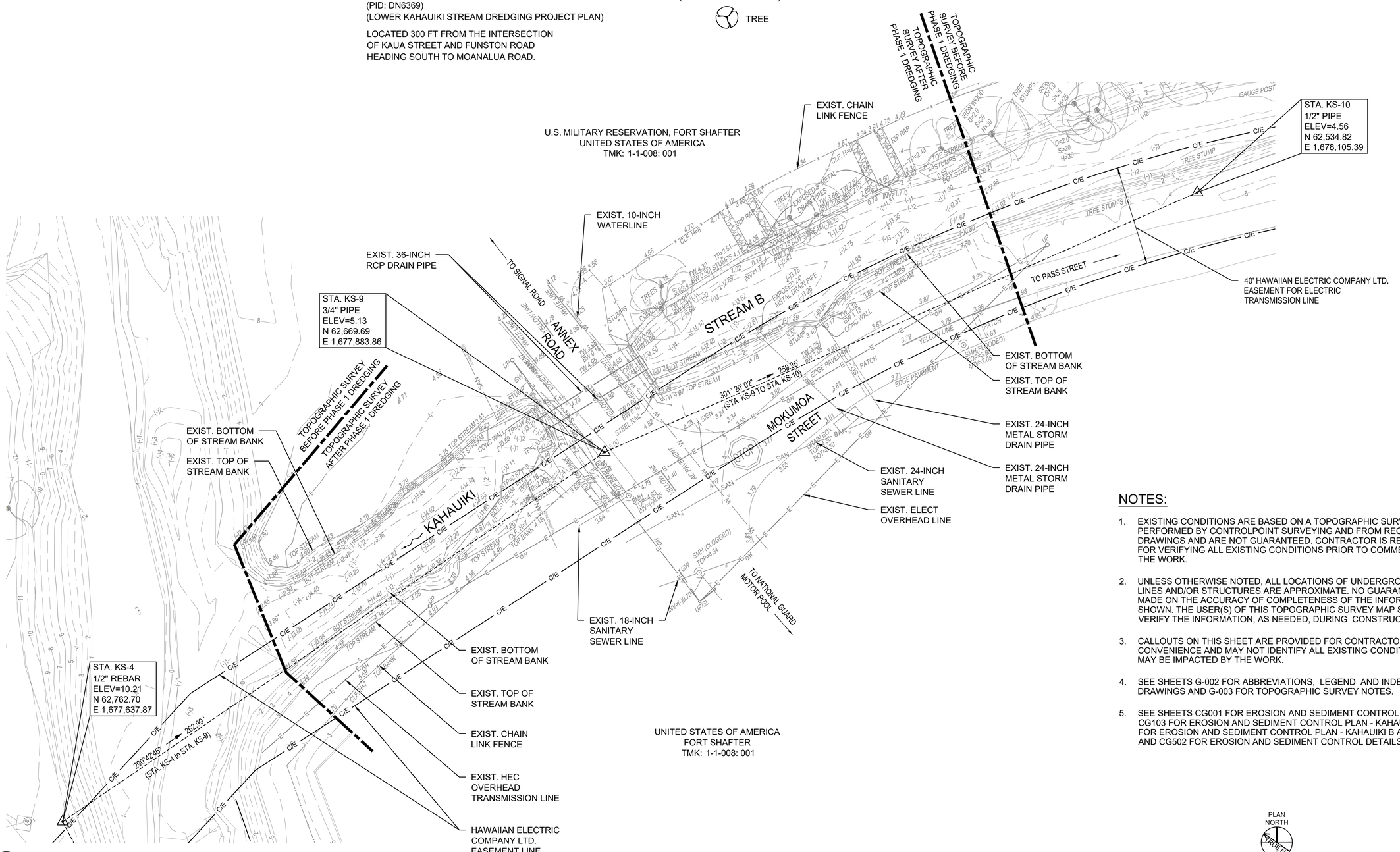
TREE

UNDERGROUND UTILITY LEGEND

MAP SYMBOL	UTIL. TYPE	CADD LAYER
W W W	WATER	V-WATR-MAIN-PIPE
SAN SAN	SEWER	V-SSWR-MAIN-PIPE
SD SD	DRAIN	V-STRM-MAIN-PIPE
E E O/H E E	ELEC OVERHEAD	V-PRIM-OVHD

VERIFICATION CLASS
A = EXCAVATED AND LOCATED
B = TONE LOCATION
C = OBSERVED LIMITED TO FIELD CONDITION
D = PER RECORD PLANS

MAP SYMBOL	A	B	C	D
WATER	☐	☐	☐	■
SEWER	☐	☐	☐	■
DRAIN	☐	☐	☐	■
ELEC OVERHEAD	☐	☐	■	☐



NOTES:

1. EXISTING CONDITIONS ARE BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY CONTROLPOINT SURVEYING AND FROM RECORD DRAWINGS AND ARE NOT GUARANTEED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO COMMENCING WITH THE WORK.
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5. SEE SHEETS CG001 FOR EROSION AND SEDIMENT CONTROL NOTES - 1, CG103 FOR EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI A, CG104 FOR EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI B AND CG501 AND CG502 FOR EROSION AND SEDIMENT CONTROL DETAILS.

PLAN NORTH

20' 0 20' 40'

A1 EXISTING SITE CONDITIONS - KAHAUIKI B
SCALE: 1" = 20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

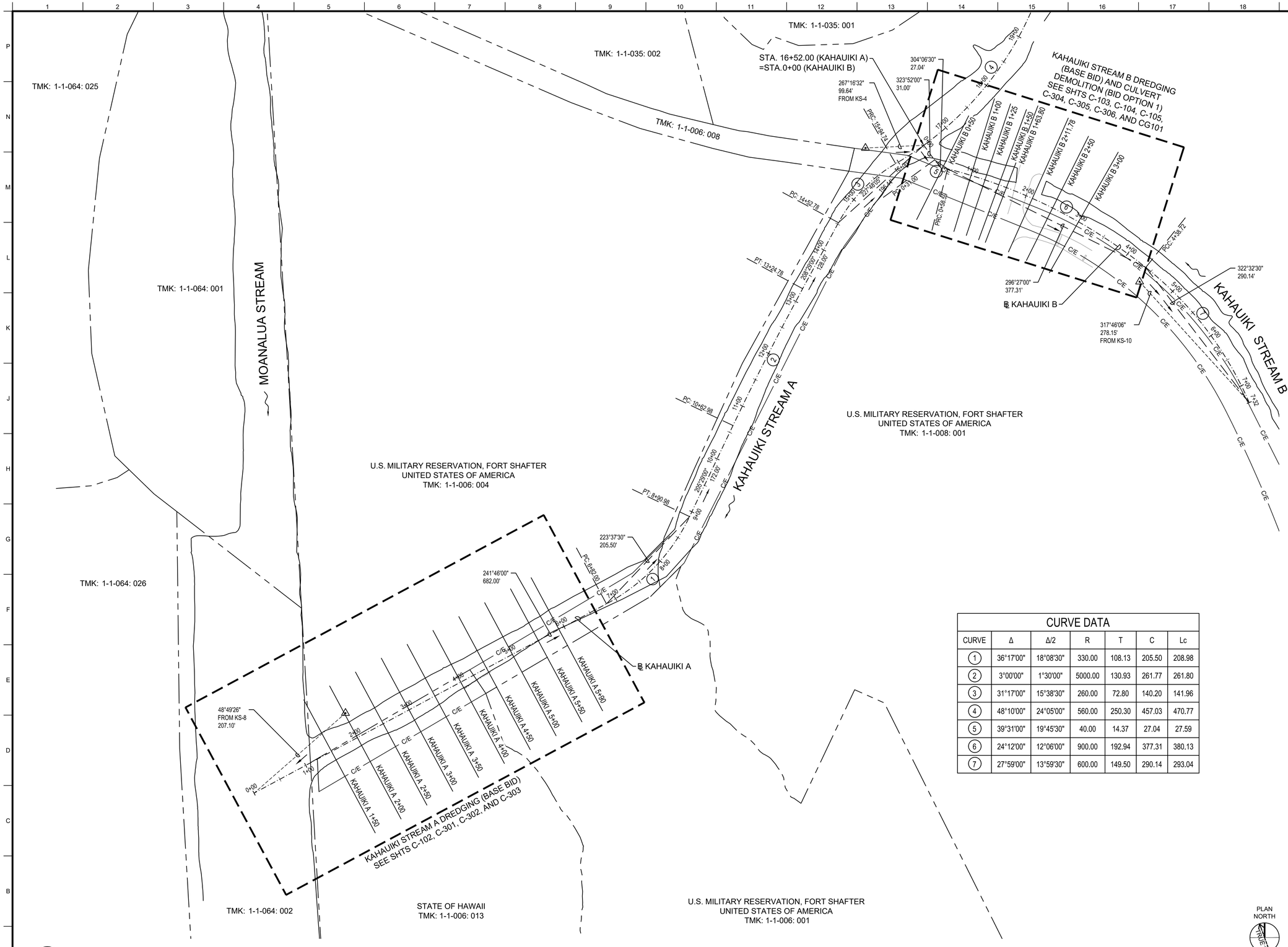
FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

EXISTING SITE CONDITIONS - KAHAUIKI B

SHEET ID
V-102

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:39 PM



CURVE DATA						
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②	3°00'00"	1°30'00"	5000.00	130.93	261.77	261.80
③	31°17'00"	15°38'30"	260.00	72.80	140.20	141.96
④	48°10'00"	24°05'00"	560.00	250.30	457.03	470.77
⑤	39°31'00"	19°45'30"	40.00	14.37	27.04	27.59
⑥	24°12'00"	12°06'00"	900.00	192.94	377.31	380.13
⑦	27°59'00"	13°59'30"	600.00	149.50	290.14	293.04

A1 GENERAL SITE PLAN AND STREAM LAYOUT PLAN
SCALE: 1" = 80'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO	ISSUE DATE: TBD
DRAWN BY: S. CARREIRA-PUAHALA	SOLICITATION NO.: TBD
CHECKED BY: M. FUJIOKA	CONTRACT NO.: TBD
SUBMITTED BY: M. FUJIOKA	
SIZE: ANSI D	RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

GENERAL SITE PLAN AND STREAM LAYOUT PLAN

SHEET ID
C-101

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:39 PM

TABLE 1: KAHAUIKI STREAM A DREDGING				
STATION	BOTTOM OF STREAM DREDGING LIMITS		TOP OF STREAM DREDGING LIMITS	
	O/S LEFT	O/S RIGHT	O/S LEFT	O/S RIGHT
1+50	19'-1"	30'-9"	35'-2"	46'-4"
1+60	11'-1"	30'-7"	24'-3"	45'-11"
1+70	9'-8"	30'-3"	22'-7"	45'-7"
1+80	9'-0"	30'-2"	22'-0"	45'-3"
1+90	8'-8"	30'-2"	21'-8"	44'-1"
2+00	8'-5"	30'-2"	21'-5"	43'-2"
2+10	8'-1"	30'-4"	21'-1"	43'-4"
2+20	8'-3"	30'-4"	21'-3"	43'-4"
2+30	8'-10"	30'-2"	21'-11"	43'-3"
2+40	9'-2"	29'-10"	22'-2"	42'-10"
2+50	8'-11"	29'-8"	21'-11"	42'-8"
2+60	8'-7"	29'-9"	21'-7"	42'-9"
2+70	8'-6"	31'-6"	21'-7"	46'-5"
2+80	9'-3"	32'-6"	22'-4"	49'-1"
2+90	9'-8"	31'-2"	22'-8"	48'-4"
3+00	9'-8"	29'-10"	22'-8"	46'-10"
3+10	9'-9"	28'-11"	22'-9"	43'-11"
3+20	9'-9"	28'-0"	22'-7"	45'-11"
3+30	9'-11"	25'-10"	22'-11"	44'-4"
3+40	10'-1"	23'-9"	23'-1"	38'-11"
3+50	10'-3"	21'-7"	23'-3"	33'-6"
3+60	10'-6"	23'-3"	23'-6"	35'-5"
3+70	10'-8"	24'-11"	23'-8"	37'-0"

TABLE 1: KAHAUIKI STREAM A DREDGING				
STATION	BOTTOM OF STREAM DREDGING LIMITS		TOP OF STREAM DREDGING LIMITS	
	O/S LEFT	O/S RIGHT	O/S LEFT	O/S RIGHT
3+80	10'-8"	24'-9"	23'-8"	36'-8"
3+90	10'-3"	24'-4"	23'-3"	36'-4"
4+00	10'-1"	23'-3"	24'-7"	34'-11"
4+10	8'-10"	21'-9"	21'-10"	32'-10"
4+20	7'-10"	21'-1"	20'-10"	32'-2"
4+30	7'-7"	20'-6"	20'-7"	33'-6"
4+40	8'-3"	18'-11"	21'-4"	32'-1"
4+50	8'-7"	17'-10"	21'-8"	30'-10"
4+60	9'-7"	18'-7"	24'-2"	31'-7"
4+70	9'-0"	20'-1"	22'-5"	31'-11"
4+80	7'-11"	20'-3"	18'-11"	32'-2"
4+90	8'-4"	19'-6"	19'-5"	32'-8"
5+00	8'-11"	17'-9"	19'-11"	31'-2"
5+10	9'-7"	15'-7"	19'-1"	28'-7"
5+20	10'-1"	15'-8"	19'-1"	30'-7"
5+30	10'-5"	13'-3"	19'-5"	30'-11"
5+40	11'-10"	11'-2"	22'-7"	28'-2"
5+50	13'-3"	13'-5"	24'-4"	30'-11"
5+60	13'-10"	15'-8"	24'-10"	30'-8"
5+70	14'-0"	14'-3"	25'-0"	31'-2"
5+80	15'-0"	13'-11"	24'-0"	32'-0"
5+90	15'-9"	14'-3"	24'-10"	34'-5"

TMK: 1-1-064: 002

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-006: 004

TRANSITION PROPOSED DREDGING TO ELEVATION OF EXIST. PHASE 1 DREDGING

EXIST. 6' HIGH CHAIN LINK FENCE WITH 3 STRAND BARBED WIRE. CONTRACTOR TO TEMPORARILY REMOVE PORTIONS AS NECESSARY FOR DREDGING OPERATIONS.

EXIST. OVERHEAD UTILITY, ABOUT 15 FEET ABOVE GROUND.

LIMITS OF DREDGING

KS-7
1/2" REBAR
ELEV=5.68
N 61,912.97
E 1,676,989.23

NEW BOTTOM OF STREAM BANK (ELEV.= - 5.5)

EXIST. BOTTOM OF STREAM BANK

EXIST. TOP OF STREAM BANK

SEE TABLE 1 FOR ALIGNMENT OFFSET.

TO KAHAUIKI STREAM B

50' HAWAIIAN ELECTRIC COMPANY LTD. EASEMENT FOR ELECTRIC TRANSMISSION LINE

TOPOGRAPHIC SURVEY BEFORE PHASE 1 DREDGING
TOPOGRAPHIC SURVEY AFTER PHASE 1 DREDGING

KAHAUIKI A 1+50
KAHAUIKI A 2+00
KAHAUIKI A 2+50
KAHAUIKI A 3+00
KAHAUIKI A 3+50
KAHAUIKI A 4+00
KAHAUIKI A 4+50
KAHAUIKI A 5+00
KAHAUIKI A 5+50
KAHAUIKI A 5+90

℄ KAHAUIKI A

KS-8
1/2" REBAR
ELEV=5.18
N 61,799.41
E 1,676,751.29

TRANSITION PROPOSED DREDGING AT A 2:1 SLOPE TO ELEVATION OF EXIST. GROUND

MOANALUA STREAM

KAHAUIKI STREAM A

EXIST. CORAL LIMITS

LIMITS OF DREDGING

EXIST. TOP OF STREAM BANK

EXIST. BOTTOM OF STREAM BANK

NEW BOTTOM OF STREAM BANK (ELEV= - 5.5)

SEE SHTS C-301, C-302, AND C-303 FOR CROSS-SECTIONS.

STATE OF HAWAII
TMK: 1-1-006: 013

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-006: 001

STATE OF HAWAII AND U.S. MILITARY RESERVATION ℄

LEGEND:

- TRANSITION PROPOSED DREDGING TO ELEVATION OF EXIST. PHASE 1 DREDGING
- TRANSITION PROPOSED DREDGING AT A 2:1 SLOPE TO ELEVATION OF EXIST. GROUND
- BOTTOM OF STREAM DREDGING LIMITS
- TOP OF STREAM DREDGING LIMITS
- EXIST. CORAL LIMITS

DREDGING QUANTITIES	
EXCAVATION	2,526 CY
IN-STREAM DISTURBED AREA	27,653 SF

NOTES:

1. UTILITY LINE BETWEEN UTILITY POLES PRESENT AN OVERHEAD HAZARD AT ABOUT 15 FEET ABOVE GROUND.
2. TREES OUTSIDE THE THE DREDGE LIMITS ARE NOT TO BE TRIMMED, CUT DOWN, OR REMOVED.
3. MAINTAIN 5-FOOT MINIMUM SETBACK FROM EXISTING STRUCTURES.
4. CORAL FORMATIONS TYPICALLY CONTAINED LOCALIZED HARD AND CRYSTALLIZED ZONES. CONTRACTOR SHALL ANTICIPATE THESE CONDITIONS DURING CONSTRUCTION. FOR LIMITS SEE SHT. BB102.

PLAN NORTH (TRUE N)

20' 0 20' 40'

A1 SITE PLAN - KAHAUIKI A (BASE BID)
SCALE: 1" = 20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SCALE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

SITE PLAN - KAHAUIKI A (BASE BID)

SHEET ID
C-102

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:39 PM

TABLE 2: KAHAUIKI STREAM B DREDGING (BASE BID)				
STATION	BOTTOM OF STREAM DREDGE LIMITS		TOP OF STREAM DREDGE LIMITS	
	O/S LEFT	O/S RIGHT	O/S LEFT	O/S RIGHT
0+50	4'-3"	8'-4"	9'-2"	15'-7"
0+60	3'-0"	8'-0"	10'-2"	13'-2"
0+70	1'-2"	9'-1"	6'-3"	16'-2"
0+80	0'-6"	10'-4"	3'-9"	15'-7"
0+90	2'-6"	11'-10"	7'-8"	19'-0"
1+00	2'-4"	11'-6"	7'-7"	16'-10"
1+10	2'-5"	9'-6"	7'-7"	12'-8"
1+20	3'-0"	10'-8"	8'-3"	16'-4"
1+30	3'-3"	6'-5"	10'-11"	13'-11"
1+40	2'-6"	3'-2"	12'-8"	14'-9"
1+50	3'-5"	0'-9"	10'-11"	9'-4"
1+60	3'-10"	-0'-9" (O/S LEFT)	8'-10"	3'-8"
1+63.80	5'-7"	2'-6"	8'-11"	7'-0"
2+11.78	4'-3"	3'-5"	8'-4"	8'-4"
2+20	3'-8"	-0'-2" (O/S LEFT)	10'-10"	1'-8"
2+30	5'-0"	2'-4"	7'-10"	7'-6"
2+40	5'-10"	3'-2"	9'-1"	8'-4"
2+50	6'-7"	3'-5"	11'-9"	8'-8"
2+60	6'-4"	5'-0"	11'-6"	10'-3"
2+70	5'-11"	6'-3"	11'-1"	11'-6"
2+80	5'-8"	8'-5"	10'-10"	15'-8"
2+90	5'-4"	6'-5"	11'-6"	14'-2"
3+00	5'-10"	2'-9"	13'-1"	10'-5"

CURVE DATA						
CURVE	Δ	Δ/2	R	T	C	Lc
(5)	39°31'00"	19°45'30"	40.00	14.37	27.04	27.59
(6)	24°12'00"	12°06'00"	900.00	192.94	377.31	380.13

CLEAN OUT 2 EXIST. 36-INCH CULVERTS TO REMAIN

SEWER LINES SHALL NOT BE REMOVED OR DISTURBED. CONTRACTOR IS RESPONSIBLE FOR DREDGING AROUND UTILITIES SUCH THAT FUNCTION OF THE SEWER LINES ARE NOT DISTURBED OR IMPACTED. ANY DAMAGE SHALL BE REPAIRED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE GOVERNMENT. SEE NOTE 3 THIS SHT.

LIMITS OF DREDGING

TO SIGNAL ROAD

℄ KAHAUIKI A

℄ KAHAUIKI B

KAHAUIKI STREAM A

KAHAUIKI STREAM B

ANNEX ROAD

MOKUMOA STREET

TO PASS STREET

TO KAHAUIKI STREAM A

TO NATIONAL GUARD MOTOR POOL

TOPOGRAPHIC SURVEY BEFORE PHASE 1 DREDGING

TOPOGRAPHIC SURVEY AFTER PHASE 1 DREDGING

KAHAUIKI B 0+50

KAHAUIKI B 1+00

KAHAUIKI B 1+50

KAHAUIKI B 1+63.80

KAHAUIKI B 2+11.78

KAHAUIKI B 2+50

KAHAUIKI B 3+00

TRANSITION PROPOSED DREDGING AT A 2:1 SLOPE TO ELEVATION OF EXIST. GROUND

STA. 16+52.00 ℄ KAHAUIKI A = STA. 0+00 ℄ KAHAUIKI B

NEW BOTTOM OF STREAM BANK (ELEV.= - 4.6)

EXIST. BOTTOM OF STREAM BANK

EXIST. TOP OF STREAM BANK

EXIST. OVERHEAD UTILITY, ABOUT 15 FEET ABOVE GROUND.

SEE SHT C-304 AND C-305 FOR BASE BID CROSS-SECTIONS. SEE SHT C-306 FOR BID OPTION 1 CROSS-SECTIONS.

HAWAIIAN ELECTRIC COMPANY LTD. EASEMENT FOR ELECTRIC TRANSMISSION LINE

40' HAWAIIAN ELECTRIC COMPANY LTD. EASEMENT FOR ELECTRIC TRANSMISSION LINE

STA. KS-10
1/2" PIPE
ELEV=4.56
N 62,534.82
E 1,678,105.39

STA. KS-9
3/4" PIPE
ELEV=5.13
N 62,669.69
E 1,677,883.86

STA. KS-7
1/2" REBAR
ELEV=5.68
N 61,912.97
E 1,676,989.23

U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA
TMK: 1-1-008: 001

LEGEND:

TRANSITION PROPOSED DREDGING AT A 2:1 SLOPE TO ELEVATION OF EXIST. GROUND

BOTTOM OF STREAM DREDGING LIMITS

TOP OF STREAM DREDGE LIMITS

DREDGING QUANTITIES	
EXCAVATION	183 CY
IN-STREAM DISTURBED AREA	4,476 SF

NOTES:

1. UTILITY LINE BETWEEN UTILITY POLES PRESENT AN OVERHEAD HAZARD AT ABOUT 15 FEET ABOVE GROUND.
2. TREES OUTSIDE THE THE DREDGE LIMITS ARE NOT TO BE TRIMMED, CUT DOWN, OR REMOVED.
3. MAINTAIN 5-FOOT MINIMUM SETBACK FROM EXISTING STRUCTURES.
4. FOR BID OPTION 1, SEE SHT. C-105.

PLAN NORTH
TRUE N

20' 0 20' 40'

A1 SITE PLAN - KAHAUIKI B (BASE BID)
SCALE: 1" = 20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
QA/QC BY: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

SITE PLAN - KAHAUIKI B (BASE BID)

SHEET ID
C-103

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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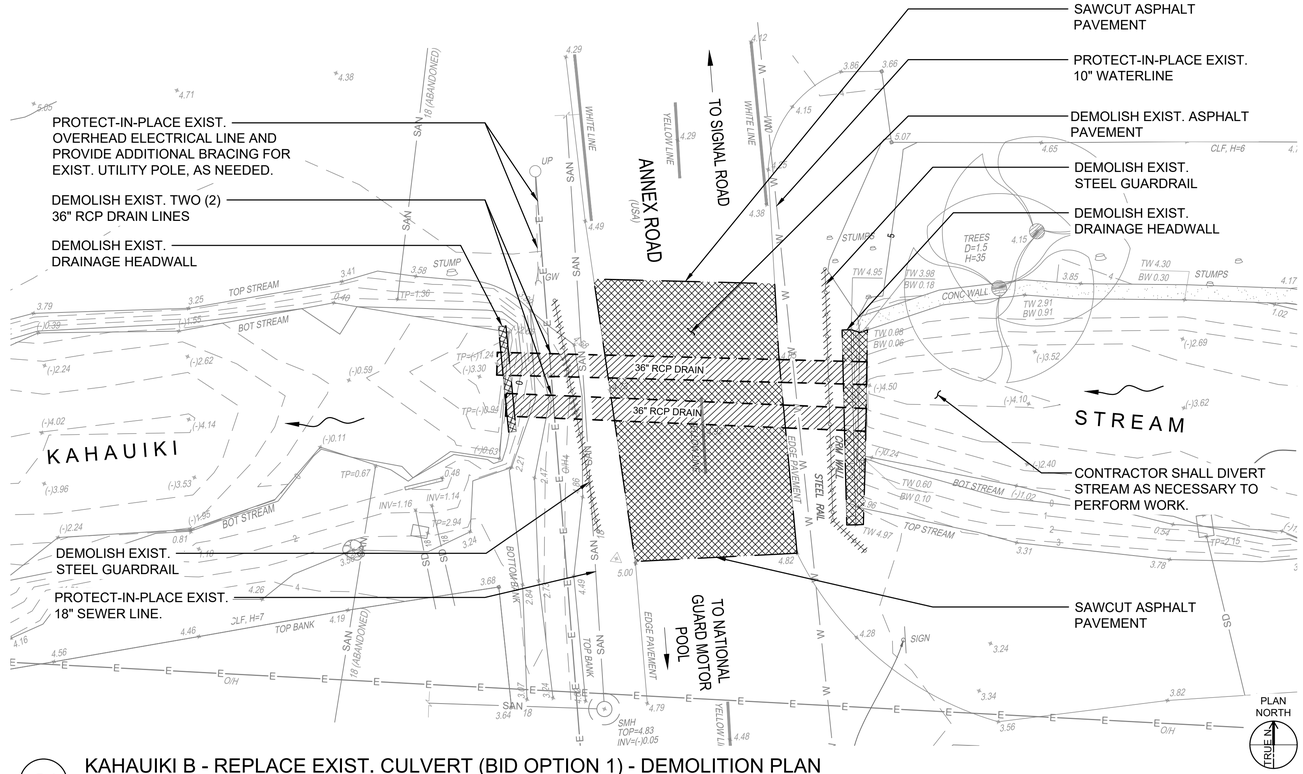
USER: BAKEDO
PLOTTED: 5/15/2025 4:40 PM



G1 KAHAUIKI B - REPLACE EXIST. CULVERT (BID OPTION 1) - DEMOLITION PLAN

SCALE: 1" = 10'

10' 0 10' 20'

LEGEND:

DEMOLITION OF EXIST. ASPHALT AND DRAINAGE HEADWALL

DEMOLITION OF EXIST. 36" RCP DRAIN

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
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U.S. ARMY CORPS OF ENGINEERS
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FORT SHAFTER, HAWAII

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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

DEMOLITION PLAN (BID OPTION 1)

SHEET ID

C-104

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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USER: BAKEDO
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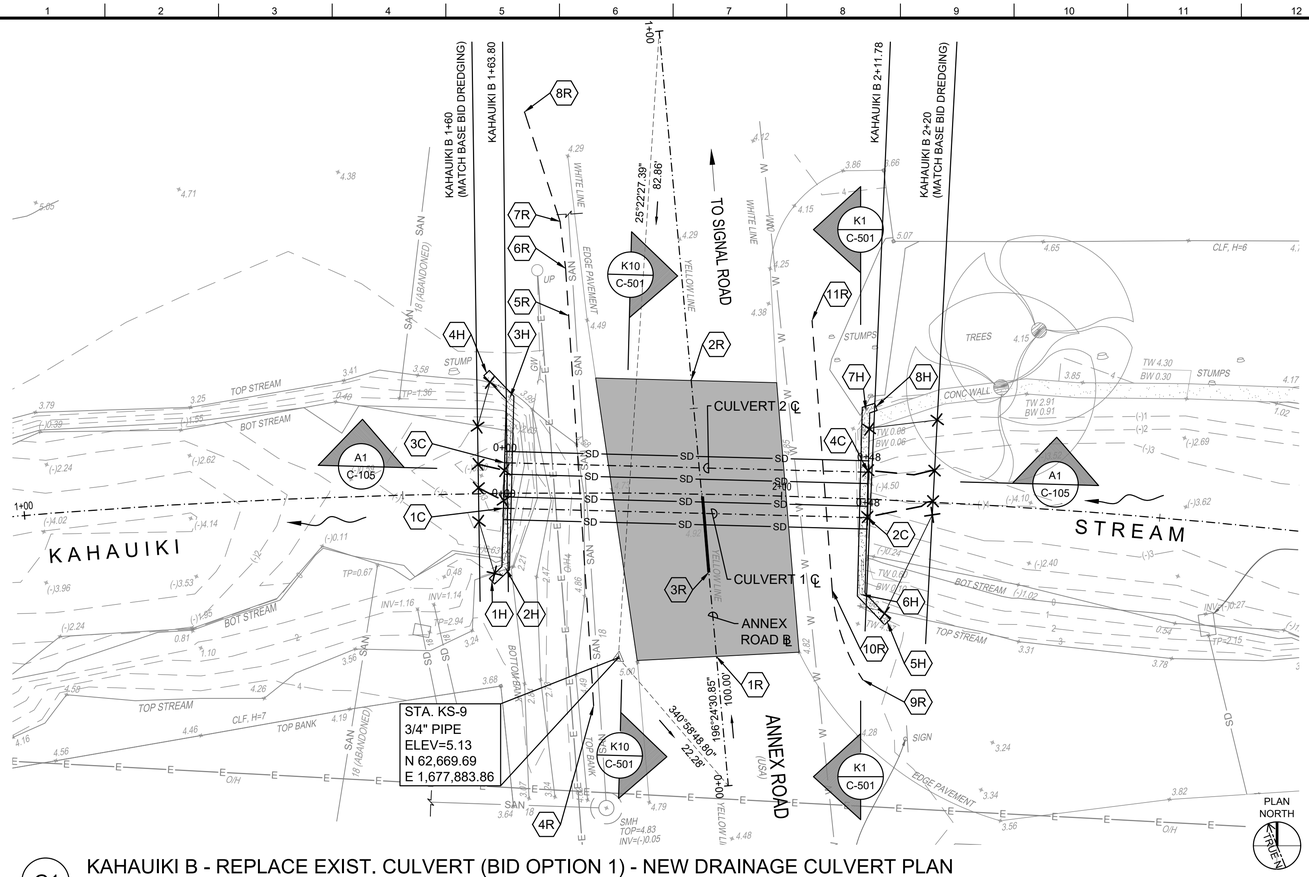
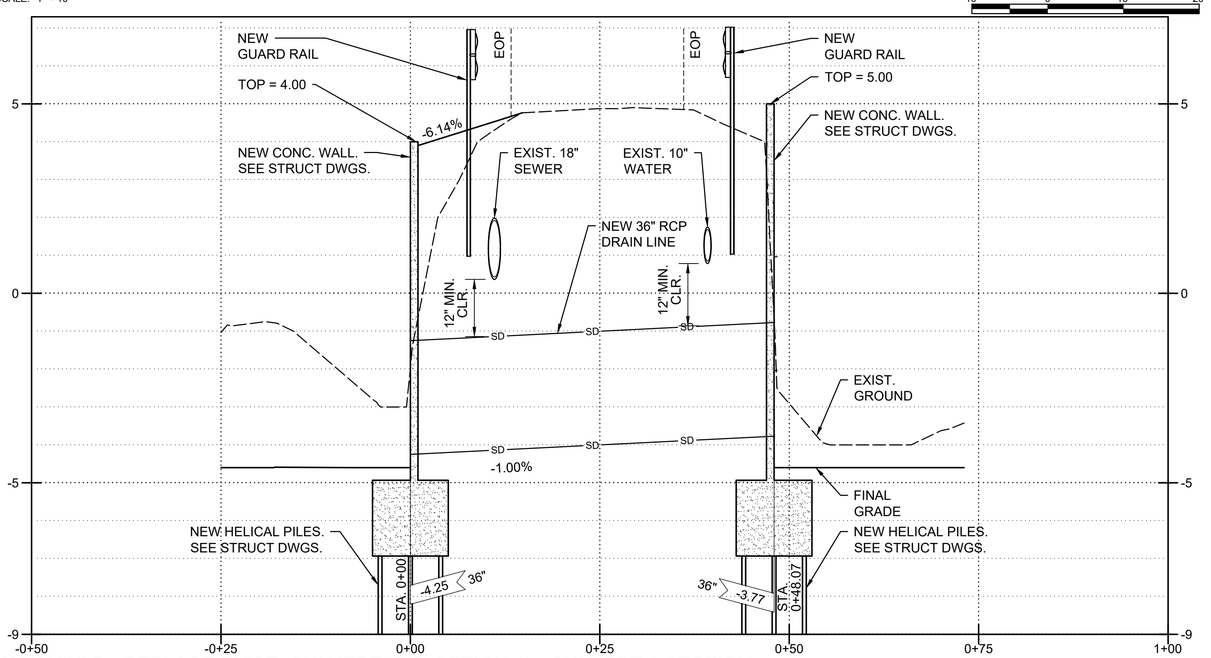


G1 KAHAUIKI B - REPLACE EXIST. CULVERT (BID OPTION 1) - NEW DRAINAGE CULVERT PLAN

SCALE: 1" = 10'



A1 KAHAUIKI B - REPLACE EXIST. CULVERT (BID OPTION 1) - CULVERT 1 SECTION

SCALE: 1" = 10'

ROADWAY NOTES:

1R STA. 0+17.14 ℄ ANNEX RD
BEGIN ROAD RECONSTRUCTION.
MATCH EXIST. PAVEMENT WIDTH.
PROVIDE SMOOTH RIDING CONN.
SEE DET. C1 / C-501

2R STA. 0+53.71 ℄ ANNEX RD
END ROAD RECONSTRUCTION.
MATCH EXIST. PAVEMENT WIDTH.
PROVIDE SMOOTH RIDING CONN.
SEE DET. C1 / C-501

3R STA. 0+28.30 ℄ ANNEX RD
INSTALL NEW 4" WIDE YELLOW PAVEMENT MARKING (10 LF).

4R STA. 0+12.15 ℄ ANNEX RD O/S 16.74 L.
START NEW GUARD RAIL.
SEE SHTS C-502 AND C-503 FOR GUARDRAIL DETAILS.
FOR GUARDRAIL END SECTION SEE DET. A15 / C-502

5R STA. 0+63.69 ℄ ANNEX RD O/S 15.33 L.
START REDUCED POST SPACING AT 38" OC.

6R STA. 0+69.94 ℄ ANNEX RD O/S 15.16 L.
GUARD RAIL DEFLECTION.

7R STA. 0+76.19 ℄ ANNEX RD O/S 15.32 L.
END REDUCED POST SPACING AT 38" OC.
GUARD RAIL DEFLECTION.

8R STA. 0+91.01 ℄ ANNEX RD O/S 18.70 L.
END GUARD RAIL.
FOR GUARDRAIL END SECTION SEE DET. A15 / C-502

9R STA. 0+12.30 ℄ ANNEX RD O/S 18.95 R.
START NEW GUARD RAIL FLARED END.
R=25'
SEE SHTS C-502 AND C-503

10R STA. 0+24.47 ℄ ANNEX RD O/S 16.01 R.
END GUARD RAIL FLARED END.
SEE SHTS C-502 AND C-503

11R STA. 0+60.12 ℄ ANNEX RD O/S 16.61 R.
END GUARD RAIL.
FOR GUARDRAIL END SECTION SEE DET. A15 / C-502

CONC. HEAD WALL NOTES:

1H STA. 0+29.72 ℄ ANNEX RD O/S 28.61 L.
BEGIN NEW 12" THICK CONC. HEAD WALL.
SEE SHT. CG101 AND STRUCT. DWGS.

2H STA. 0+31.27 ℄ ANNEX RD O/S 26.65 L.
NEW CONC. HEAD WALL BEND.

3H STA. 0+53.61 ℄ ANNEX RD O/S 24.01 L.
NEW CONC. HEAD WALL BEND.

4H STA. 0+57.15 ℄ ANNEX RD O/S 26.80 L.
END NEW CONC. HEAD WALL.

5H STA. 0+19.60 ℄ ANNEX RD O/S 22.87 R.
BEGIN NEW CONC. HEAD WALL.
SEE SHT. CG101 AND STRUCT. DWGS.

6H STA. 0+23.52 ℄ ANNEX RD O/S 19.77 R.
NEW CONC. HEAD WALL BEND.

7H STA. 0+47.71 ℄ ANNEX RD O/S 22.62 R.
NEW CONC. HEAD WALL BEND.

8H STA. 0+48.02 ℄ ANNEX RD O/S 23.96 R.
END NEW CONC. HEAD WALL.

CULVERT NOTES:

1C STA. 0+39.18 ℄ ANNEX RD O/S 26.22 L.
= 0+00 ℄ CULVERT 1.
START 36" RCP DRAIN LINE.
INV. = -4.25

2C STA. 0+33.56 ℄ ANNEX RD O/S 21.53 R.
= 0+48.07 ℄ CULVERT 1.
END 36" RCP DRAIN LINE.
INV. = -3.77

3C STA. 0+45.14 ℄ ANNEX RD O/S 25.52 L.
= 0+00 ℄ CULVERT 2.
START 36" RCP DRAIN LINE.
INV. = -4.25

4C STA. 0+39.51 ℄ ANNEX RD O/S 22.23 R.
= 0+48.07 ℄ CULVERT 2.
END 36" RCP DRAIN LINE.
INV. = -3.77

LEGEND:

- A.C. PAVEMENT RECONSTRUCTION
- NEW CONC. WALL
- NEW GUARD RAIL
- SD — NEW 36" RCP DRAIN LINE
- BOTTOM OF STREAM DREDGING LIMITS
- TOP OF STREAM DREDGE LIMITS

TABLE 2: KAHAUIKI STREAM B DREDGING (BID OPTION 1)				
STATION	BOTTOM OF STREAM DREDGE LIMITS		TOP OF STREAM DREDGE LIMITS	
	O/S LEFT	O/S RIGHT	O/S LEFT	O/S RIGHT
1+60	3'-10"	-0'-9" (O/S LEFT)	8'-10"	3'-8"
1+63.80	4'-8"	1'-6"	14'-8"	10'-7"
2+11.78	3'-9"	2'-3"	9'-5"	15'-0"
2+20	3'-8"	-0'-2" (O/S LEFT)	10'-10"	1'-8"

ADDITIONAL DREDGING QUANTITIES	
EXCAVATION	3 CY
IN-STREAM DISTURBED AREA	87 SF

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

SITE PLAN - KAHAUIKI B (BID OPTION 1)

SHEET ID
C-105

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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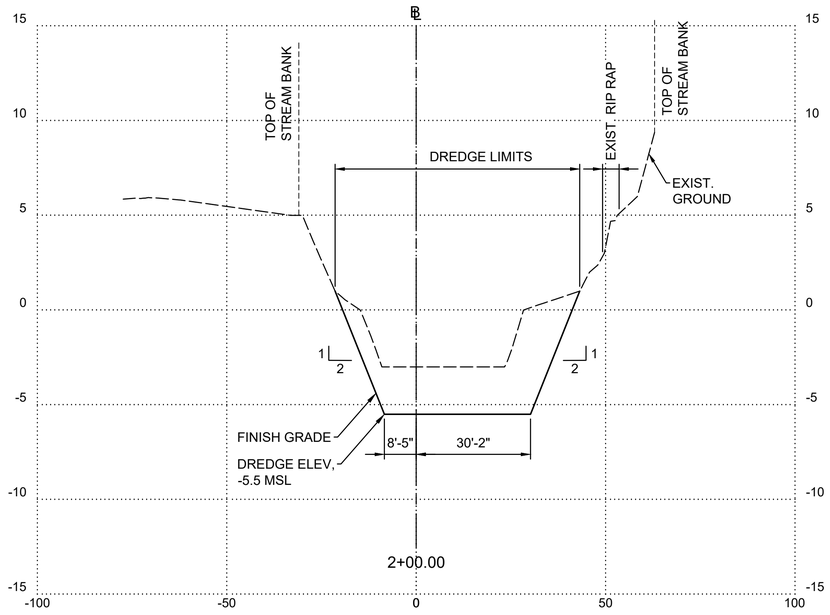

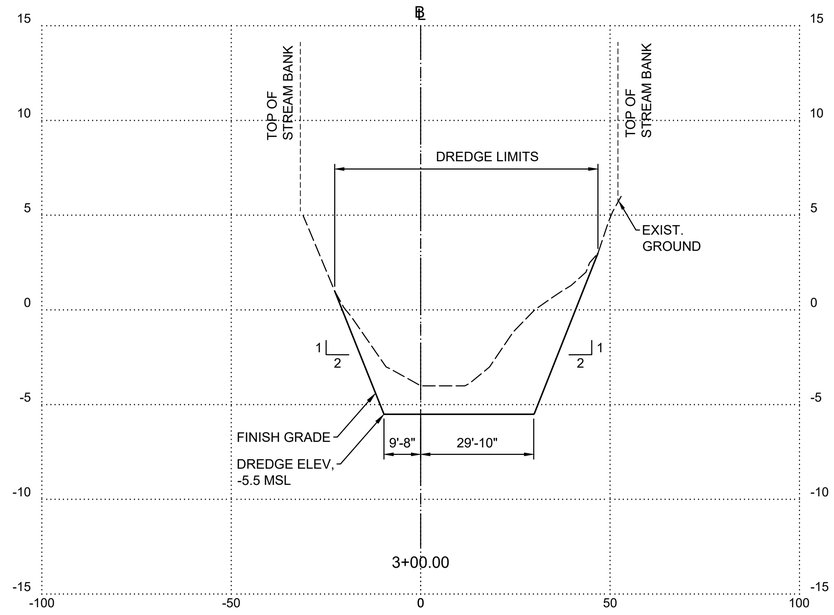

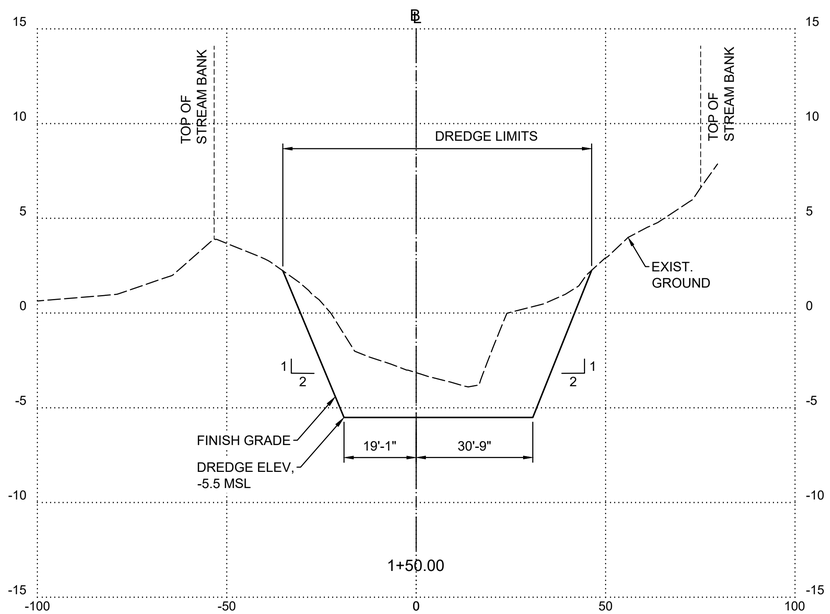

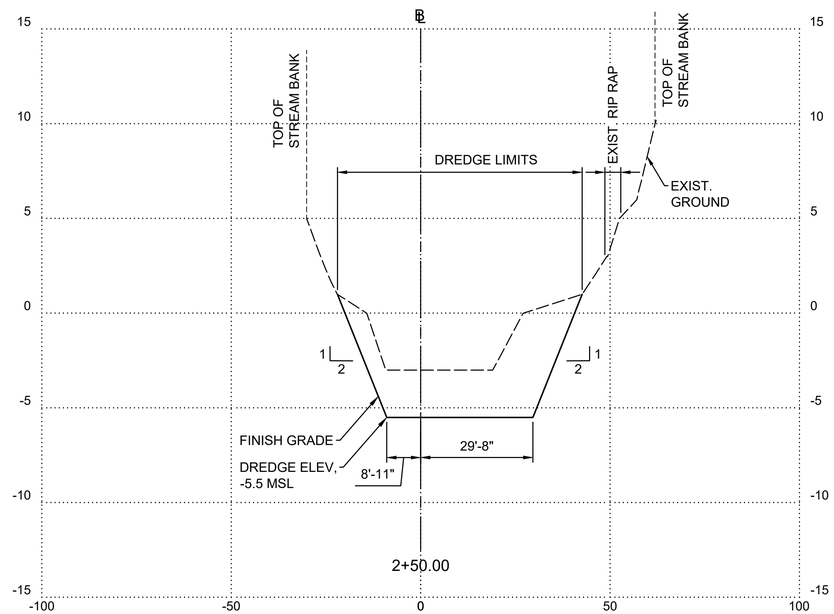

A1 CROSS-SECTIONS 1 - KAHAUIKI A

SCALE: 1" = 20' (HORIZ)
1"= 4' (VERT)

20' 0 20' 40'
4' 0 4' 8'

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MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

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FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
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HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CROSS-SECTIONS 1 - KAHAUIKI A

SHEET ID
C-301

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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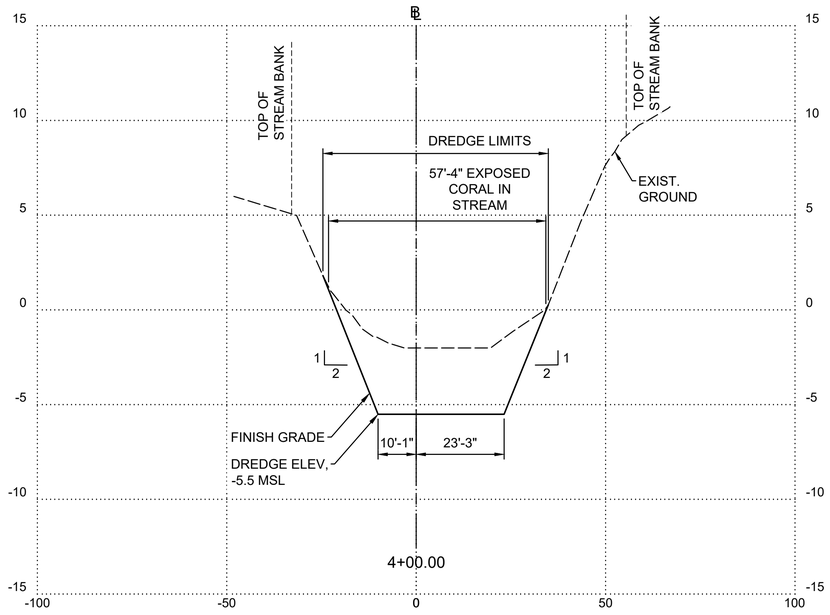

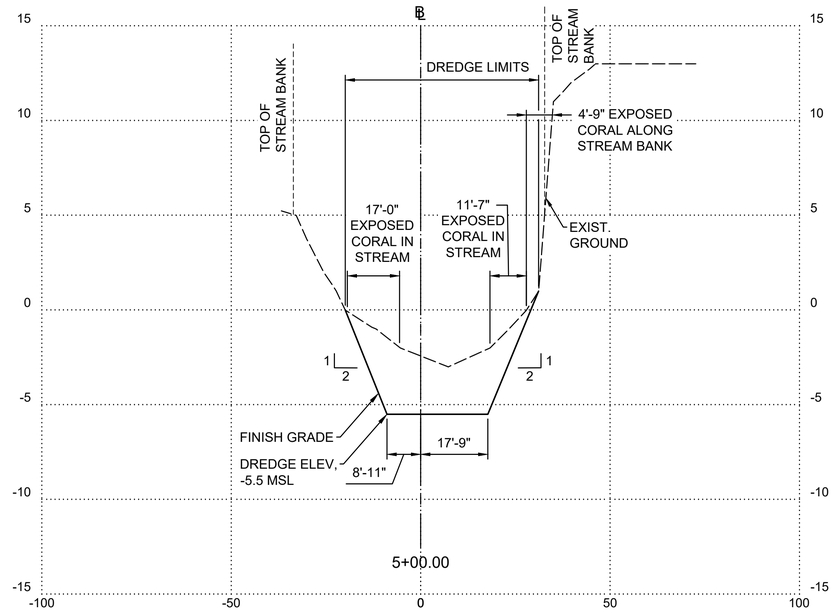

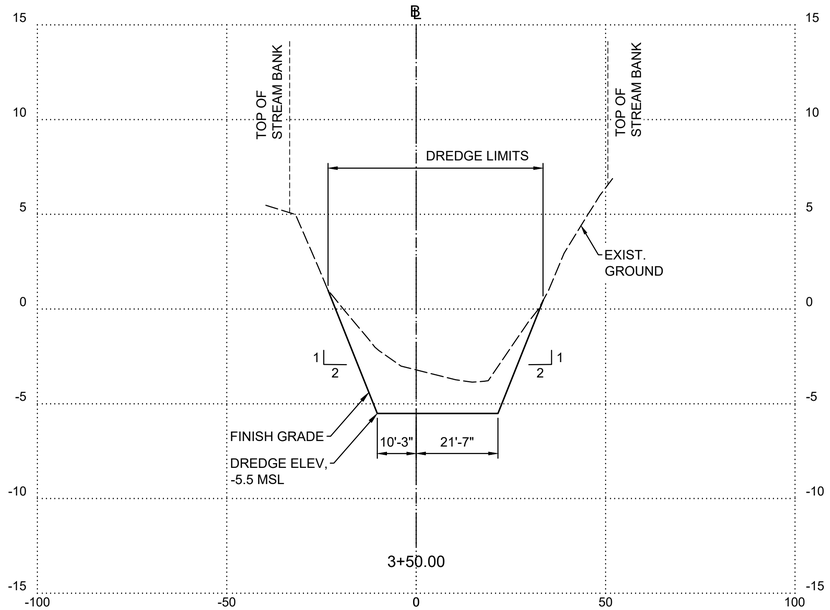

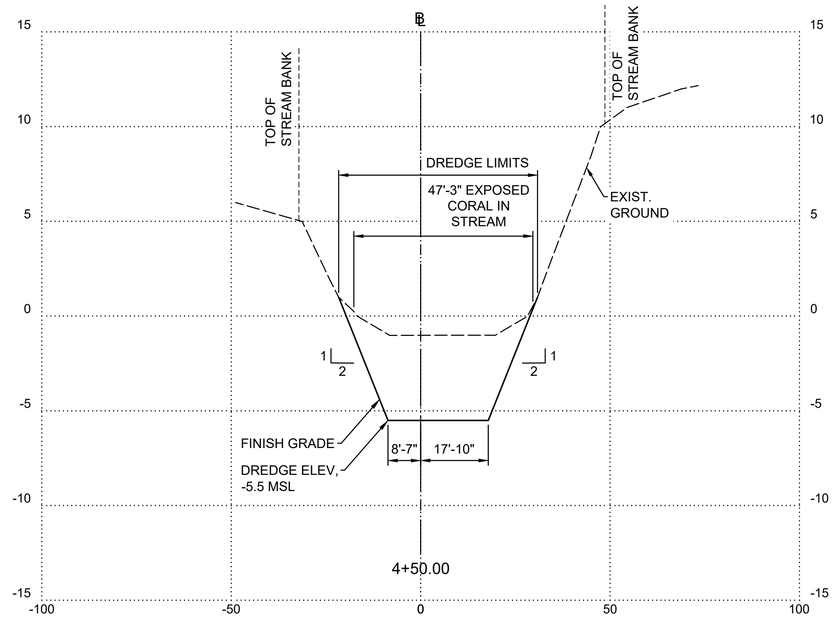

A1 CROSS-SECTIONS 2 - KAHAUIKI A

SCALE: 1" = 20' (HORIZ)
1"= 4' (VERT)

20' 0 20' 40'
4' 0 4' 8'

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MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CROSS-SECTIONS 2 - KAHAUIKI A

SHEET ID
C-302

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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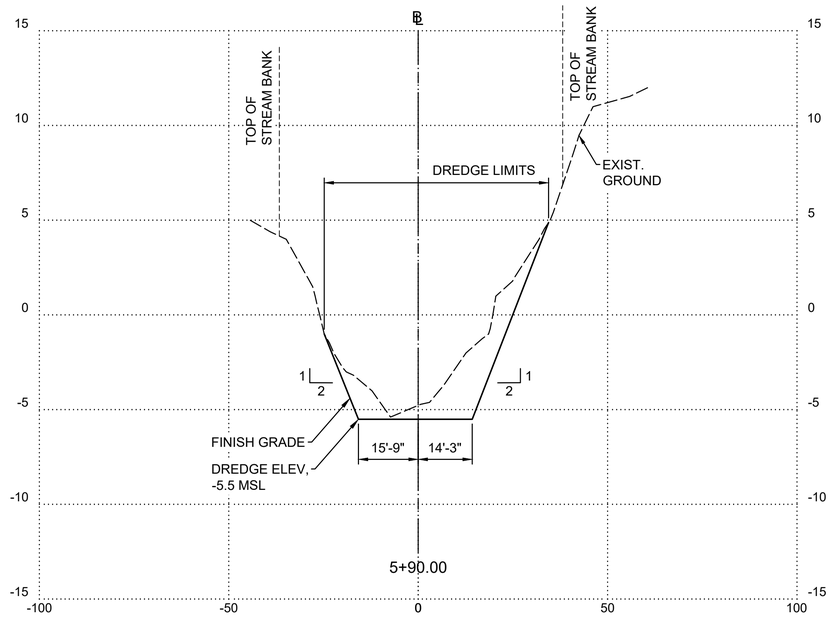

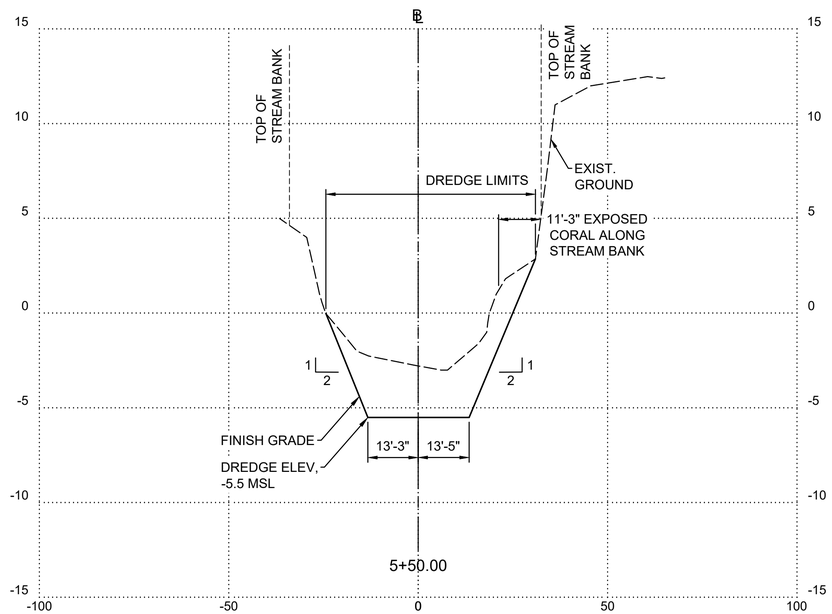

A1 CROSS-SECTIONS 3 - KAHAUIKI A

SCALE: 1" = 20' (HORIZ)
1"= 4' (VERT)

20' 0 20' 40'
4' 0 4' 8'

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FORT SHAFTER FLATS INSTALLATION
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KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CROSS-SECTIONS 3 - KAHAUIKI A

SHEET ID
C-303

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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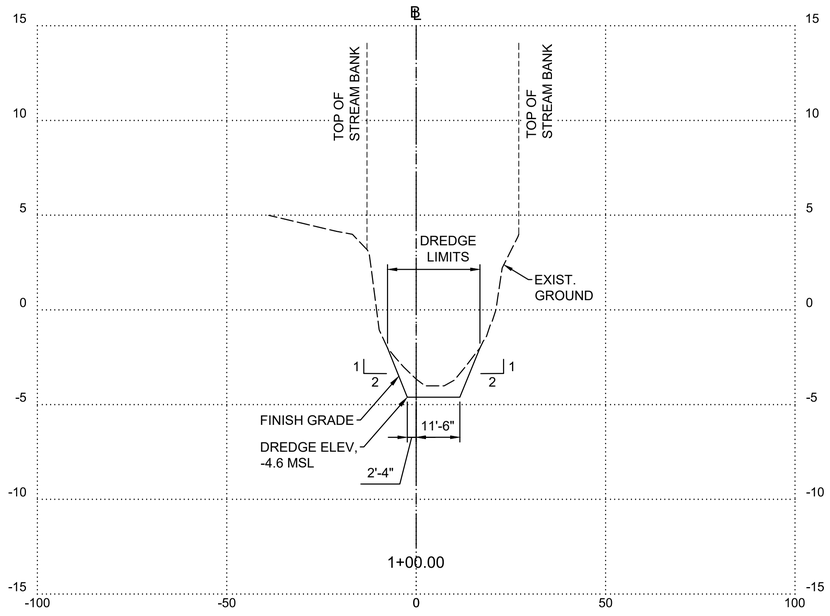

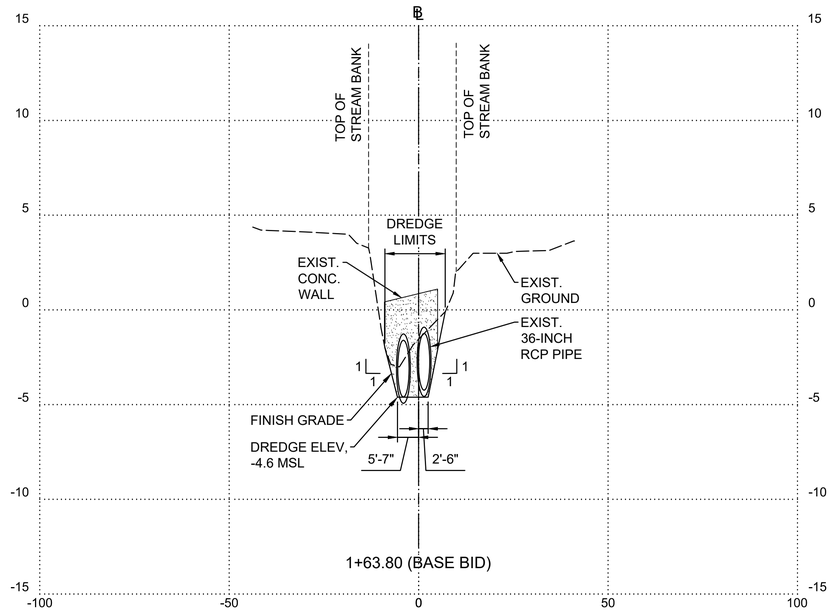

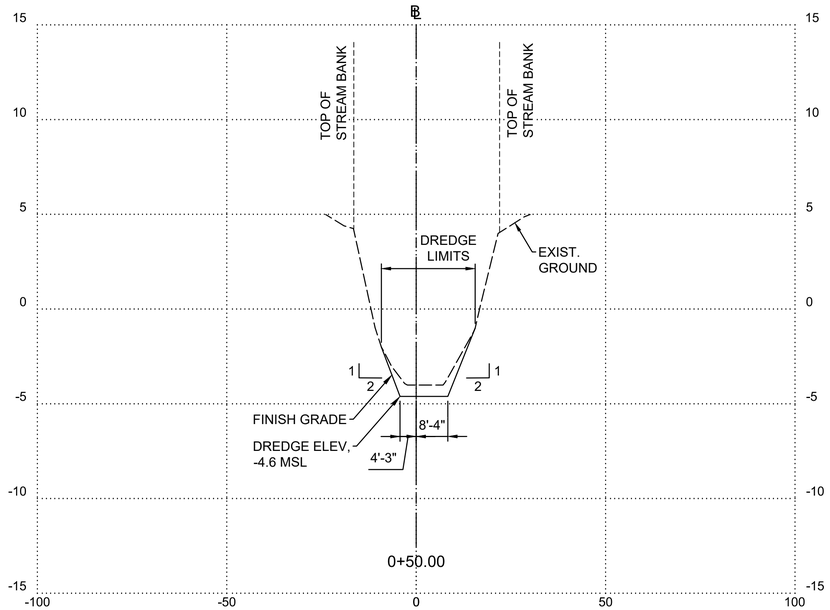

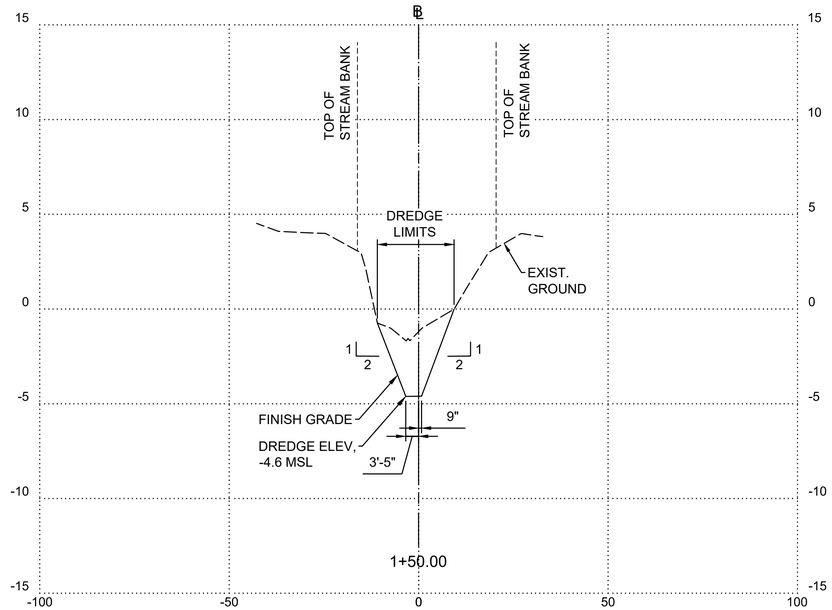

A1 CROSS-SECTIONS 1 - KAHAUIKI B

SCALE: 1" = 20' (HORIZ)
1"= 4' (VERT)

20' 0 20' 40'
4' 0 4' 8'

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HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CROSS-SECTIONS 1 - KAHAUIKI B

SHEET ID
C-304

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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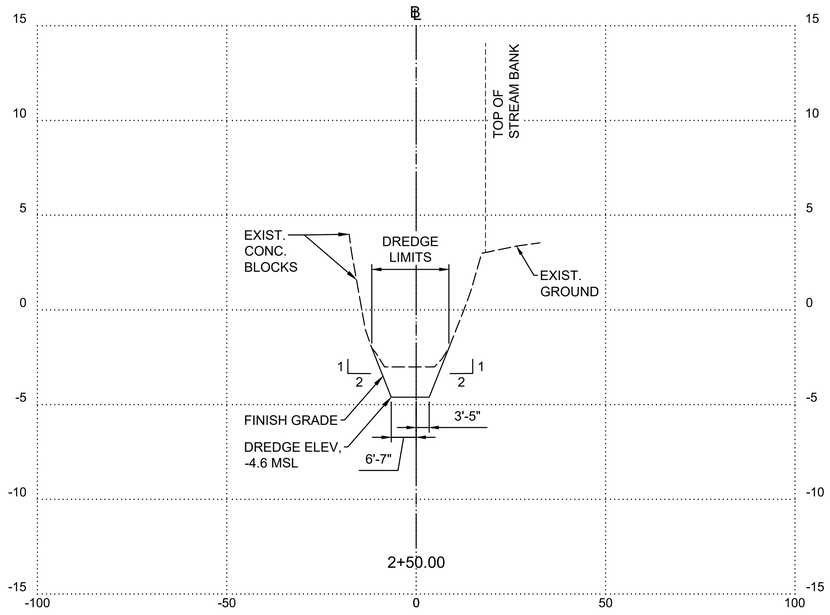

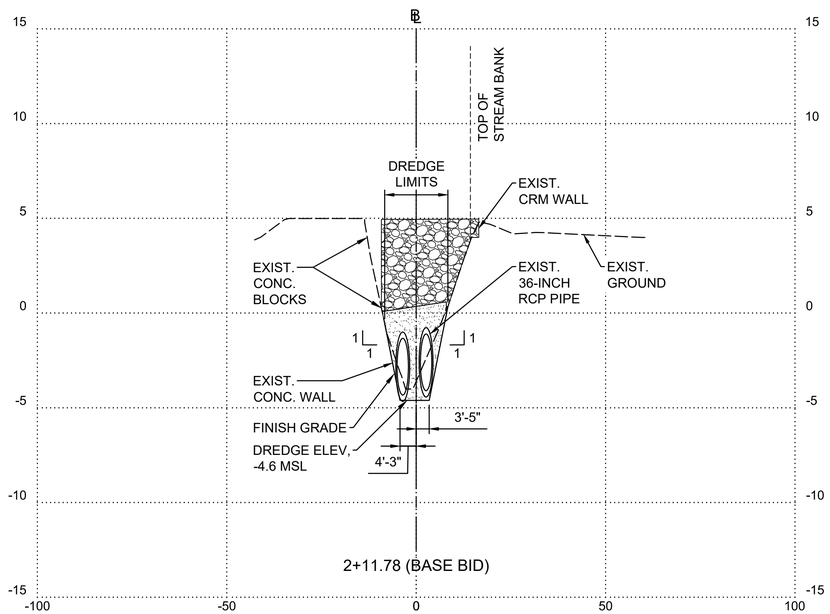

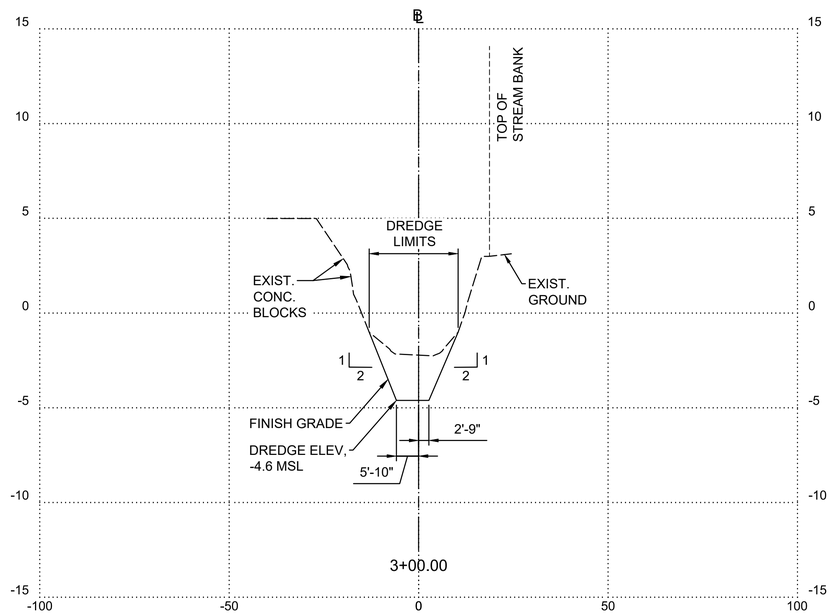

A1 CROSS-SECTIONS 2 - KAHAUIKI B

SCALE: 1" = 20' (HORIZ)
1"= 4' (VERT)

20' 0 20' 40'
4' 0 4' 8'

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SUBMITTED BY: M. FUJIOKA	
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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CROSS-SECTIONS 2 - KAHAUIKI B

SHEET ID

C-305

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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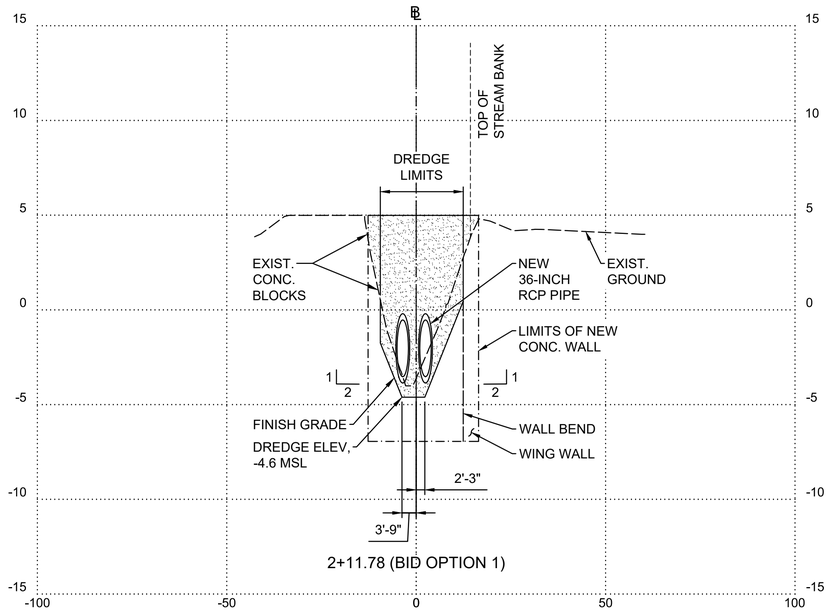
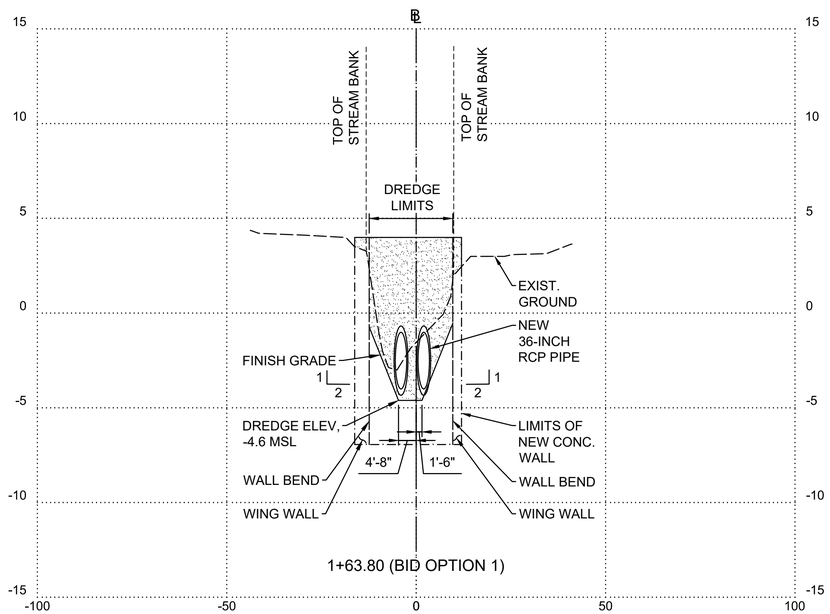


2+11.78 (BID OPTION 1)



1+63.80 (BID OPTION 1)

A1 CROSS-SECTIONS 3 - KAHAUIKI B

SCALE: 1" = 20' (HORIZ)
1"= 4' (VERT)

20' 0 20' 40'
4' 0 4' 8'

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MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CROSS-SECTIONS 3 - KAHAUIKI B

SHEET ID
C-306

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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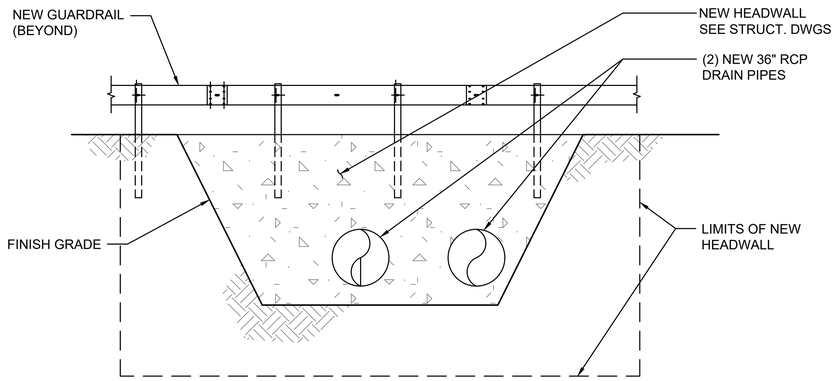
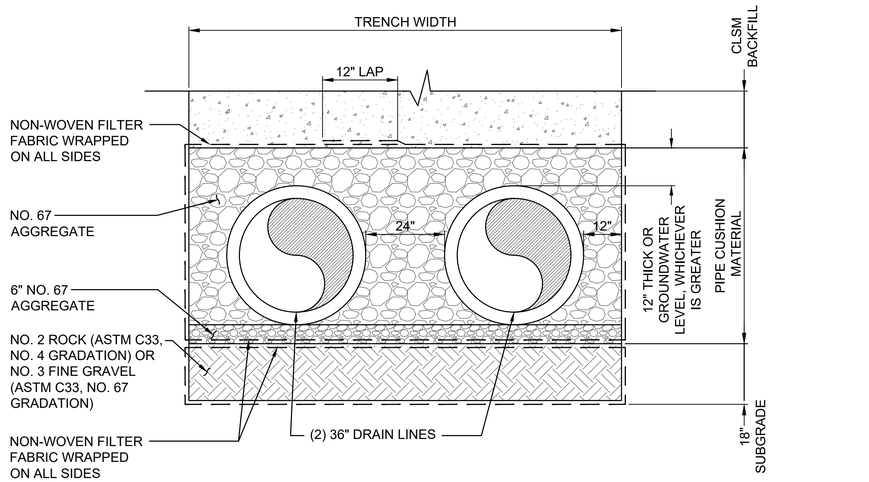
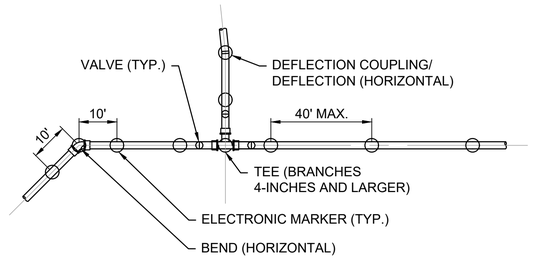


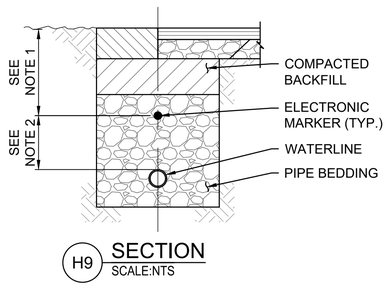
K1 HEADWALL SECTION DETAIL
SCALE: NTS



K10 DRAINAGE PIPE TRENCH SECTION DETAIL
SCALE: NTS



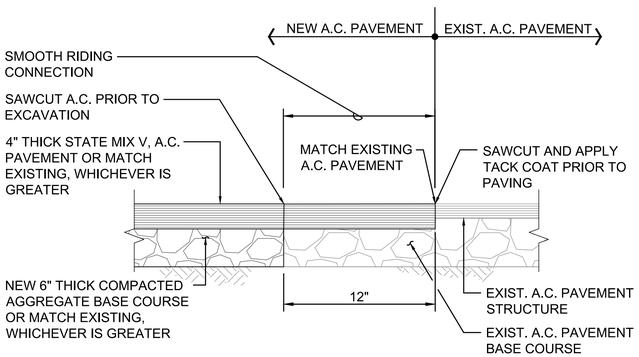
L11 PLAN
SCALE:NTS



H9 SECTION
SCALE:NTS

NOTES:

1. INSTALL ELECTRONIC MARKER OVER CENTER LINE OF PIPE AT A MINIMUM DEPTH OF 24 INCHES AND A MAXIMUM DEPTH OF 36 INCHES FROM FINISH GRADE.
2. INSTALL ELECTRONIC MARKER AT A MINIMUM CLEARANCE OF 6-INCHES ABOVE THE PIPE OR CONCRETE JACKET.
3. INSTALL ONE MARKER AT THE END OF ALL MAINS.
4. INSTALL MARKERS AT THE BEGINNING AND END OF ALL CONCRETE JACKETS.
5. INSTALLED MARKERS SHALL NOT BE PLACED AT CROSSINGS WITH ELECTRICAL DUCT LINES, GAS LINES OR TELEPHONE DUCT LINES. INSTALL MARKERS AT A MINIMUM CLEARANCE OF 5 FEET FROM THESE UTILITY CROSSINGS.
6. INSTALL TRENCH BACKFILL AND PIPE BEDDING MATERIAL IN ACCORDANCE TO PLANS AND SPECIFICATIONS.



C1 SMOOTH RIDING CONNECTION DETAIL
SCALE: NTS

C8 ELECTRONIC MARKER INSTALL DETAIL
SCALE: NTS

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MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
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HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

CIVIL DETAILS

SHEET ID
C-501

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
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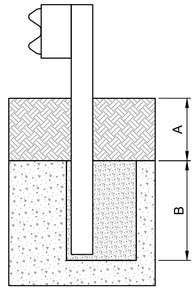
NOTES (STRONG POST W-BEAM IN ROCK):

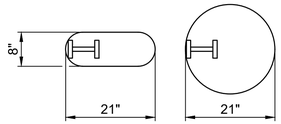
1. BACKFILL OF DRILLED HOLES SHALL BE WITH COMPRESSIBLE MATERIAL, ASTM C33 COARSE AGGREGATE, SIZE NO. 57.

2. ELONGATED 21-INCH LONG HOLE CAN BE ACCOMPLISHED BY DRILLING THREE 8-INCH DIAMETER HOLES AT 6 1/2-INCHES ON CENTER.

CASE 1



SOIL ROCK OR AC

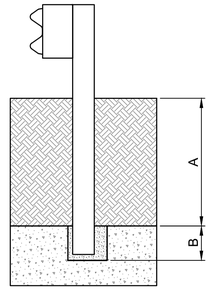


PLAN VIEW STEEL POSTS
EITHER HOLE CONFIGURATION ACCEPTABLE

(A) RANGING FROM 0 TO 18-INCHES, THE DEPTH OF REQUIRED DRILLING
(B) IS EQUAL TO 24-INCHES.

OVERLYING SOIL DEPTHS OF 0 TO 18-INCHES

CASE 2

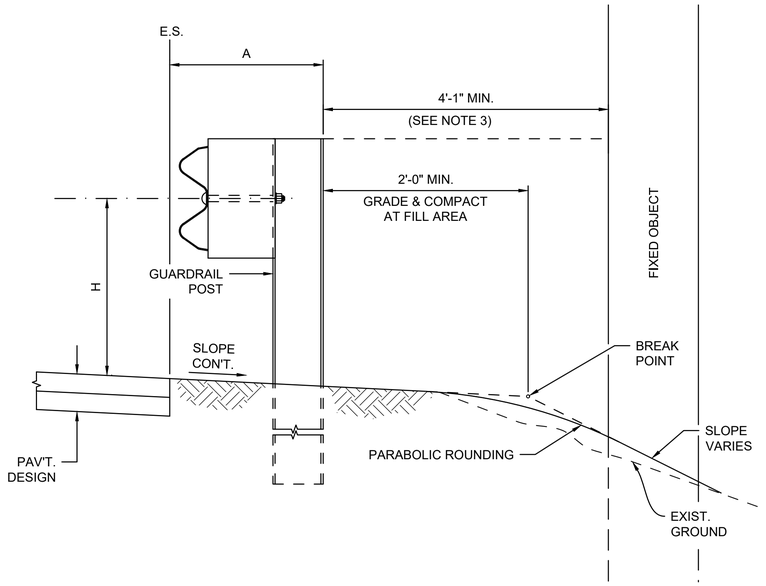


ASTM C33 COARSE AGGREGATE, SIZE NO. 57

(A) RANGING FROM 18-INCHES TO THE EMBEDMENT DEPTH OF THE POST, DEPTH OF REQUIRED DRILLING
(B) IS EQUAL TO EITHER 12-INCHES OR THE DESIRED EMBEDMENT DEPTH MINUS THE DEPTH OF SOIL, WHICHEVER IS LESS.

OVERLYING SOIL DEPTHS OF 18 TO 42-INCHES

F1 F1 - STRONG POST W-BEAM GUARDRAIL IN ROCK DETAIL
SCALE: NTS



F8 TYPICAL GUARDRAIL INSTALLATION DETAIL
SCALE: NTS

GENERAL NOTES:

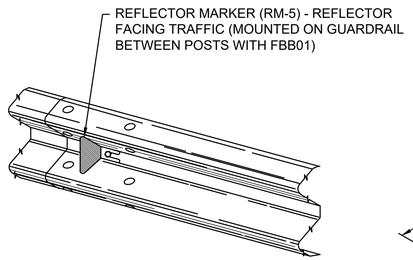
1. ALL HARDWARE, POSTS AND FASTENERS SHALL BE HOT-DIP ZINC COATED GALVANIZED AFTER FABRICATION. NO PUNCHING, DRILLING OR CUTTING WILL BE PERMITTED AFTER GALVANIZING.

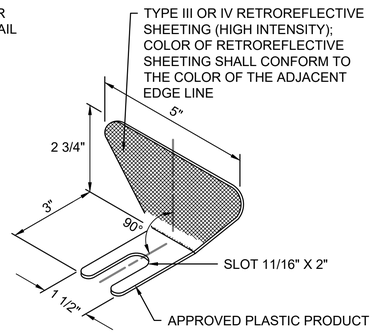
2. ALL FASTENERS, POSTS, AND RAIL ELEMENTS (I.E. FBB03, PWE01, RWM04B, ETC.) SHALL CONFORM TO THE LATEST EDITION AND AMENDMENTS OF "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE", A REPORT PREPARED AND APPROVED BY THE AASHTO-AGC-ARTBA JOINT COOPERATIVE COMMITTEE, SUBCOMMITTEE ON NEW HIGHWAY MATERIALS, TASK FORCE 13 REPORT. DIMENSIONS OF FASTNERS, POSTS AND RAIL ELEMENTS HAVE BEEN CONVERTED FROM METRIC UNITS INTO THEIR PRESENT FORM.

3. MINIMUM WORKING WIDTH (CLEAR DISTANCE) BETWEEN BACK OF MGS POST TO ANY FIXED OBJECT IS 4'-1" (49").

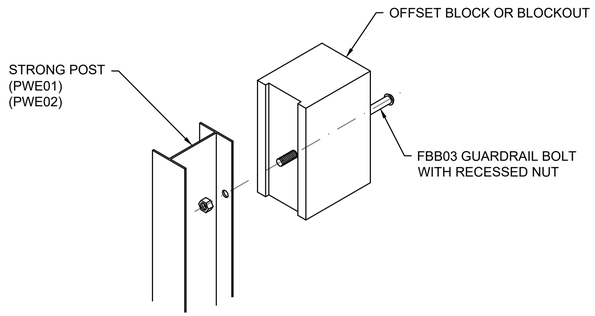
4. REFLECTOR MARKERS (RM-5) MOUNTED ON GUARDRAILS SHALL BE SPACED EVERY 25 FEET. RM-5'S SHALL NOT BE INSTALLED ON TERMINAL SECTIONS. FURNISHING AND INSTALLING OF EACH RM-5 SHALL BE CONSIDERED INCIDENTAL TO NEW GUARDRAIL SYSTEMS.

GUARDRAIL TYPE	DIMENSION	
	H	A
MGS W/ STANDARD 8" OFFSET BLOCK	2'-1"	VARIES 2'-0" TO 6'-4"



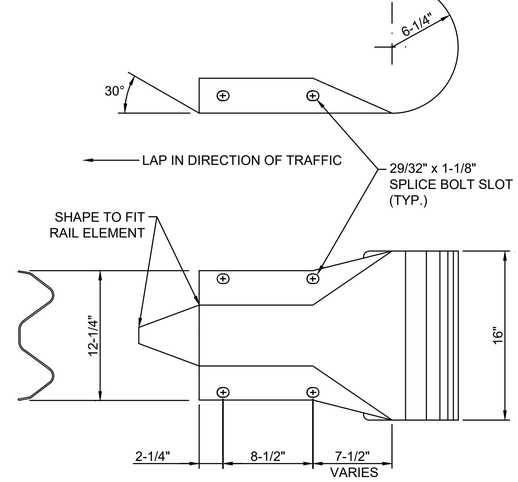


A1 REFLECTOR MARKER (RM-5) AND TYPICAL INSTALLATION DETAIL
SCALE: NTS



EXPLODED VIEW
(RAIL AND WASHER NOT SHOWN)

A8 STEEL POST AND BLOCK DETAIL
SCALE: NTS



DESIGNATOR	BASE METAL THICKNESS
RWE03A	12 GAUGE

A15 W-BEAM END SECTION (ROUNDED RWE03A)
SCALE: NTS

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MARK	DESCRIPTION	DATE

DESIGNED BY: B. AKEDO
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CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
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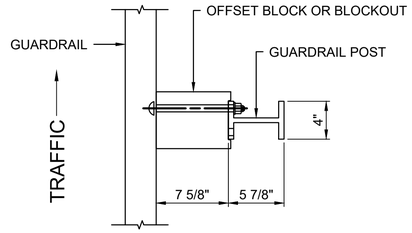
FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

GUARDRAIL DETAILS - 1

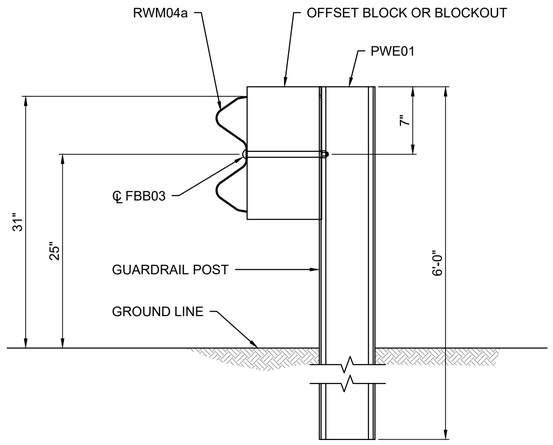
SHEET ID
C-502

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

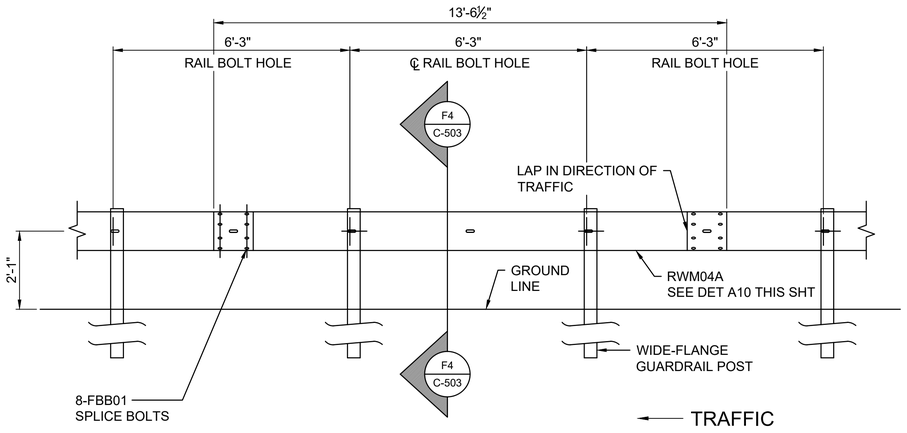
FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:41 PM



K4 PLAN
SCALE: NTS

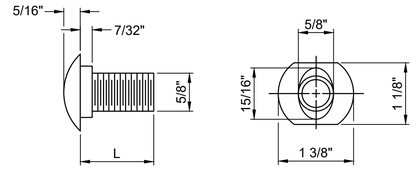


F4 SECTION
SCALE: NTS

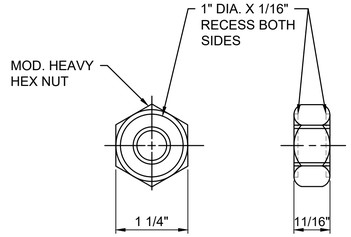


A4 ELEVATION
SCALE: NTS

A1 MIDWEST GUARDRAIL SYSTEM WITH STANDARD 8" OFFSET BLOCK (SGR47) DETAIL
SCALE: NTS



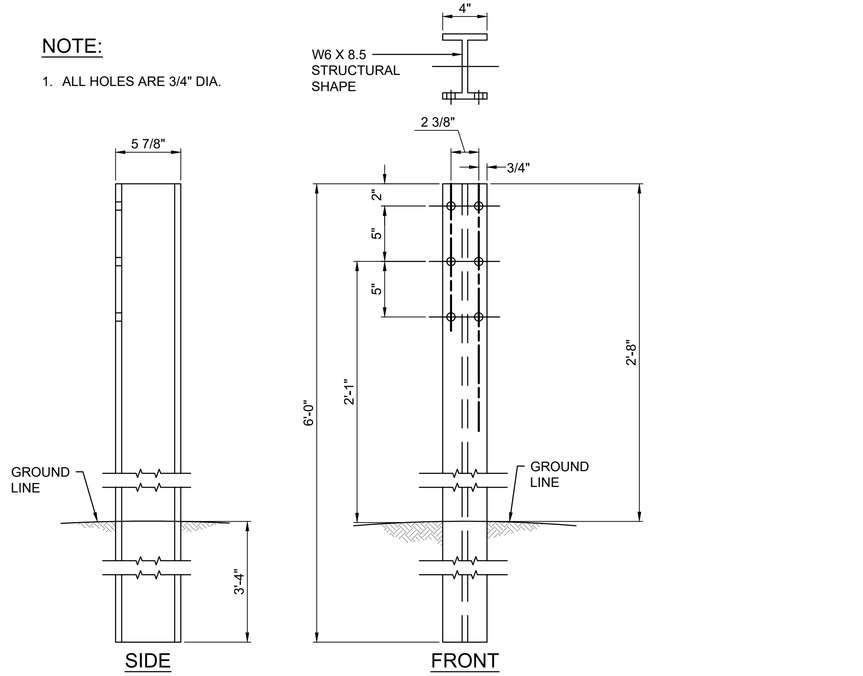
DESIGNATOR	L
FBB01	1 3/8"
FBB02	2"
FBB03	10"



L10 GUARDRAIL BOLTS AND RECESSED NUT DETAIL
SCALE: NTS

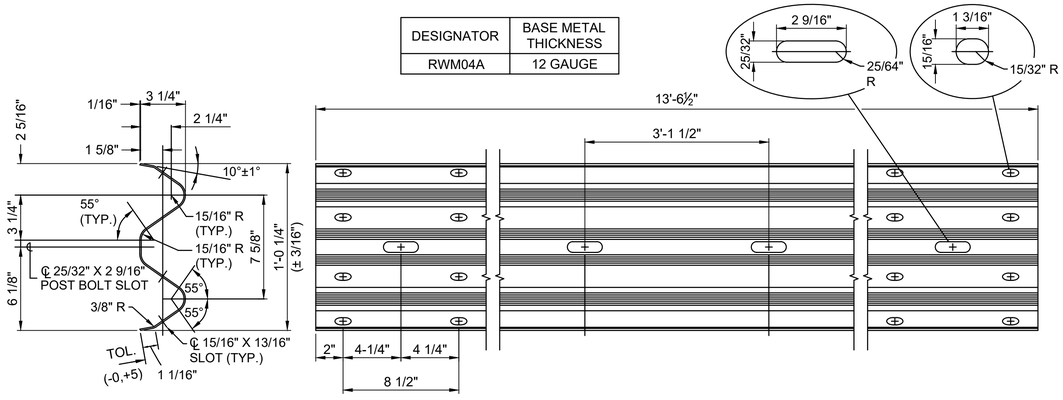
NOTE:

1. ALL HOLES ARE 3/4" DIA.



E10 WIDE-FLANGED GUARDRAIL POST (PWE01) DETAIL
SCALE: NTS

DESIGNATOR	BASE METAL THICKNESS
RWM04A	12 GAUGE



A10 4 SPACE W-BEAM GUARDRAIL (RWMO4A) DETAIL
SCALE: NTS

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DESIGNED BY: B. AKEDO
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CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D
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ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

GUARDRAIL DETAILS - 2

SHEET ID
C-503

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: Y:\Proj\222\222-069 kahauiki stream dredging\CAD\Sheets
USER: BAKEDO
PLOTTED: 5/15/2025 4:42 PM

EROSION CONTROL AND BEST MANAGEMENT PRACTICE (BMP) NOTES

1. THE CONTRACTOR SHALL COMPLY WITH USAG-HI DPW CONSTRUCTION SITE RUNOFF CONTROL PROGRAM POLICY MEMO DATED MAY 12, 2022. FOR "LARGE PROJECTS" (ONE ACRE OR MORE OF TOTAL LAND DISTURBED):

   A. USE OF BMPS. THE USAG-HI HAS ADOPTED REFERENCE 1.F., WHICH PROVIDES STANDARDS FOR TEMPORARY BMP INSTALLATION AND MAINTENANCE THAT SHALL BE ADHERED TO FOR INSTALLATION AND MAINTENANCE OF BMPS.

   DPW-ENVIRONMENTAL CLEAN WATER PROGRAM RESERVES THE RIGHT TO INSPECT ANY PROJECT ON USAG-HI PROPERTY TO ENSURE ALL REGULATIONS ARE BEING STRICTLY ADHERED TO.

   https://home.army.mil/hawaii/application/files/5516/5249/9001/Construction_Site_Runoff_Control_Policy_Program_12MAY2022.pdf

2. PROVIDE ALL SITE SPECIFIC BEST MANAGEMENT PRACTICES DOCUMENTS (ENVIRONMENTAL PROTECTION PLANS (EPP) OR EROSION AND SEDIMENT CONTROL SHEETS) TO DPW CLEAN WATER PROGRAM FOR APPROVAL PRIOR TO START OF WORK. DPW CLEAN WATER PROGRAM WILL REVIEW AND PROVIDE COMMENTS. WORK SHOULD NOT START UNTIL AN APPROVAL IS OBTAINED.

3. IMPLEMENT SEDIMENT AND EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPS) CONSISTENT WITH THE CITY AND COUNTY OF HONOLULU'S STORM WATER BEST MANAGEMENT PRACTICE MANUAL FOR CONSTRUCTION, AUGUST 2017, THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES TO PREVENT SEDIMENT AND CONSTRUCTION DEBRIS FROM ENTERING THE STORM DRAIN SYSTEM.

4. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTHWORK IS INITIATED.

5. STREAM BANKS TO REMAIN UNDISTURBED. SEE SHT. CG501.

6. SLOPE PROTECTION IS REQUIRED ON AREAS WITH SLOPES GREATER THAN 15% AND ON AREAS OF MODERATE SLOPE THAT ARE PRONE TO EROSION UNLESS THEY ARE BEING ACTIVELY WORKED. USE DIVERSION UPSTREAM OF SLOPE (DIKES, SWALES, SLOPE DRAINS) TO DIVERT WATER AROUND THE SLOPE. PROVIDE A 10-FOOT BUFFER ZONE AT THE TOE OF SLOPE. ONLY 5 ACRES MAY BE DISTURBED AT ANY TIME ON SLOPES GREATER THAN 15%.

7. TEMPORARY STABILIZATION IS REQUIRED ON DISTURBED AREAS WHICH ARE AT FINAL GRADE OR WHEN THE DISTURBED AREA WILL NOT BE WORKED FOR 14 CONSECUTIVE DAYS OR MORE.

8. PERMANENTLY STABILIZE ALL DISTURBED AREAS USING VEGETATIVE COVERING, PAVEMENT, OR EQUIVALENT, PRIOR TO REMOVING EROSION AND SEDIMENT CONTROL MEASURES. TRAPPED SEDIMENT AND AREAS OF DISTURBED SOIL WHICH RESULT FROM THE REMOVAL OF THE TEMPORARY MEASURES SHALL BE IMMEDIATELY AND PERMANENTLY STABILIZED.

9. PRESERVE EXISTING VEGETATION. CLEARLY MARK THE AREAS TO BE PRESERVED WITH FLAGS OR TEMPORARY FENCING. WHERE TEMPORARY FENCING IS USED, FENCING MUST BE ADEQUATELY SUPPORTED BY POSTS AND MAINTAINED IN AN UPRIGHT POSITION.

10. MINIMIZE SOIL COMPACTION IN AREAS WHERE FINAL STABILIZATION WITH VEGETATION OR INFILTRATION PRACTICES WILL BE INSTALLED. PROTECT AREAS FROM EXCESSIVE COMPACTION DURING CONSTRUCTION. VEHICLE AND EQUIPMENT USE SHALL BE RESTRICTED OR TECHNIQUES TO CONDITION THE SOILS TO SUPPORT VEGETATION SHALL BE IMPLEMENTED IN THE AREAS THAT HAVE BEEN COMPACTED AND ARE DESIGNATED TO REMAIN VEGETATIVE OR POST-CONSTRUCTION INFILTRATION AREAS. CLEARLY MARK THE AREAS TO BE AVOIDED WITH FLAGS OR TEMPORARY FENCING, WHERE TEMPORARY FENCING IS USED, FENCING MUST BE ADEQUATELY SUPPORTED BY POSTS AND MAINTAINED IN AN UPRIGHT POSITION.

11. PERIMETER CONTROLS ARE REQUIRED DOWNSLOPE OF ALL DISTURBED AREAS. MAINTAIN DOWNSTREAM VEGETATED BUFFER AREA.

12. SEDIMENT FENCES OR BARRIERS SHALL BE USED DOWN SLOPE OF ALL DISTURBED AREAS. UNTIL SLOPES ARE STABILIZED A SEDIMENT FENCE OR BARRIER SHALL BE INSTALLED AT THE TOE OF THE SLOPE AND ON CONTOURS AT THE FOLLOWING SPACING:

    SLOPE $\geq$ 2H:1V — 10 FEET SPACING
    SLOPE $\geq$ 4H:1V AND $<$ 2H:1V — 15 FEET SPACING
    SLOPE $<$ 4H:1V — 20 FEET SPACING

13. INLET PROTECTION MEASURES:

    A. ALL STORM DRAIN INLETS ONSITE AND THOSE OFFSITE WHICH MAY RECEIVE RUNOFF FROM THE SITE SHALL USE AN INLET PROTECTION DEVICE UNLESS THEY ARE DIRECTED TO A SEDIMENT BASIN.
    B. SEDIMENT LEVELS MAY NOT EXCEED ONE THIRD OF THE HEIGHT OF SEDIMENT BARRIER OR INLET PROTECTION DEVICE AT ANY POINT ALONG THE LENGTH OF THE SEDIMENT BARRIER OR THE INLET PROTECTION DEVICE.
    C. SEDIMENT BARRIERS AND INLET PROTECTION DEVICES MUST BE UNCLOGGED AND CLEANED WHEN PERFORMANCE IS COMPROMISED.
    D. TORN, WEATHERED OR SAGGING SEDIMENT BARRIERS OR INLET PROTECTION DEVICES MUST BE REPAIRED OR REPLACED IMMEDIATELY.

14. SEDIMENT BASINS MUST BE KEPT IN EFFECTIVE OPERATING CONDITION AND SEDIMENT SHALL BE REMOVED TO MAINTAIN AT LEAST ONE HALF OF THE DESIGN CAPACITY AT ALL TIMES.

15. TRACKING CONTROL MEASURES:

    A. MINIMIZE SEDIMENT TRACK-OUT ONTO OFF-SITE STREETS, OTHER PAVED AREAS, AND SIDEWALKS FROM VEHICLES EXITING THE CONSTRUCTION SITE BY RESTRICTING VEHICLE TRAFFIC TO PROPERLY DESIGNATED AREAS AND USING ADDITIONAL CONTROLS TO REMOVE SEDIMENT FROM VEHICLE TIRES PRIOR TO EXITING THE SITE.
    B. VEHICULAR PARKING AND MOVEMENT ON PROJECT SITES MUST BE CONFINED TO PAVED SURFACES OR PREDEFINED PARKING AREAS AND VEHICLE PATHS, WHICH SHALL BE MARKED WITH FLAGS OR BOUNDARY FENCING. CONTRACTOR SHALL COORDINATE WITH OFFICER-IN-CHARGE.
    C. ALL POLLUTANTS AND MATERIALS THAT ARE DROPPED, WASHED, TRACKED, SPILLED, OR OTHERWISE DISCHARGED FROM A PROJECT SITE TO OFF-SITE STREETS, OTHER PAVED AREAS, SIDEWALKS OR THE MS4 MUST BE CLEANED USING DRY METHODS SUCH AS SWEEPING OR VACUUMING.
    D. WASHING POLLUTANTS AND MATERIALS THAT ARE DISCHARGED FROM THE PROJECT SITE TO THE MS4 INTO DRAIN INLETS OR CATCH BASINS IS PROHIBITED UNLESS THE MATERIAL IS SEDIMENT AND THE INLETS ARE DIRECTED TO A SEDIMENT BASIN OR SEDIMENT TRAP.

16. ALL DISTURBED AREAS MUST BE REVEGETATED TO 70% OR GREATER FROM PRECONSTRUCTION CONDITIONS. BMPS MUST REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED. REVEGETATE AND PROVIDE IRRIGATION/BMPS UNTIL AREA IS STABILIZED.

17. BEST MANAGEMENT PRACTICES (BMPS) SHALL NOT BE REMOVED UNTIL FINAL STABILIZATION IS COMPLETE FOR THAT PHASE.

BMP NOTES (CONT.)

18. THE EROSION CONTROL PLAN ILLUSTRATES THE MINIMUM EROSION CONTROL MEASURES TO BE IMPLEMENTED DURING CONSTRUCTION AND PRIOR TO COMMENCEMENT OF ANY GROUND DISTURBANCE, INCLUDING DEMOLITION WORK. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL EROSION CONTROL MEASURES, AS REQUIRED, TO PREVENT EROSION FROM CONSTRUCTION ACTIVITIES AND POLLUTION INTO STATE WATERS.

19. EXPOSED TRENCH AREAS IN PAVED AREAS SHALL BE PROTECTED FROM RUNOFF AND WIND EROSION WITH STEEL PLATE COVERS UNTIL REPAVING IS COMPLETED.

20. CONTRACTOR SHALL ENSURE ROADWAYS WILL BE PROTECTED FROM MUD, DIRT, AND DEBRIS.

21. WASHWATER FROM WASHDOWNS OF CONSTRUCTION EQUIPMENT, VEHICLES AND CONCRETE TRUCK DRUMS SHALL NOT BE DISCHARGED INTO THE DRAINAGE SYSTEMS OR STATE WATERS.

22. AT THE CONCLUSION OF ALL PROJECT WORK, ALL BMPS SHALL BE REMOVED AND THE AREA SHALL BE RESTORED TO ITS ORIGINAL CONDITION, OR BETTER, UPON ACCEPTANCE OF THE PROJECT BY THE CONTRACTING OFFICER.

U.S. FISH AND WILDLIFE SERVICE BEST MANAGEMENT PRACTICES (BMPS)

1. TURBIDITY AND SILTATION FROM PROJECT-RELATED WORK SHALL BE MINIMIZED AND CONTAINED WITHIN THE VICINITY OF THE SITE THROUGH THE APPROPRIATE USE OF EFFECTIVE SILT CONTAINMENT DEVICES AND THE CURTAILMENT OF WORK DURING ADVERSE TIDAL AND WEATHER CONDITIONS.

2. DREDGING/FILLING IN THE MARINE ENVIRONMENT SHALL BE SCHEDULED TO AVOID CORAL SPAWNING AND RECRUITMENT PERIODS AND SEA TURTLE NESTING AND HATCHING PERIODS.

3. DREDGING/FILLING IN THE MARINE/AQUATIC ENVIRONMENT SHALL BE DESIGNED TO AVOID OR MINIMIZE THE LOSS SPECIAL AQUATIC SITE HABITAT (BEACHES, CORAL REEFS, WETLANDS, ETC.) AND THE FUNCTION OF SUCH HABITAT SHALL BE REPLACED.

4. ALL PROJECT-RELATED MATERIALS AND EQUIPMENT (DREDGES, BARGES, BACKHOES, ETC.) TO BE PLACED IN THE WATER SHALL BE CLEANED OF POLLUTANTS PRIOR TO USE.

5. NO PROJECT-RELATED MATERIALS (FILL, REVETMENT ROCK, PIPE, ETC.) SHOULD BE STOCKPILED IN THE WATER (INTERTIDAL ZONES, REEF FLATS, STREAM CHANNELS, WETLANDS, ETC.) OR ON BEACH HABITATS.

6. ALL DEBRIS REMOVED FROM THE MARINE/AQUATIC ENVIRONMENT SHALL BE DISPOSED OF AT AN APPROVED UPLAND OR OCEAN DUMPING SITE.

7. NO CONTAMINATION (TRASH OR DEBRIS DISPOSAL, NON-NATIVE SPECIES INTRODUCTION, ATTRACTION OF NON-NATIVE PESTS, ETC.) OF ADJACENT HABITATS (REEF FLATS, CHANNELS, OPEN OCEAN, STREAM CHANNELS, WETLANDS, BEACHES, FORESTS, ETC.) SHALL RESULT FROM PROJECT-RELATED ACTIVITIES. THIS SHALL BE ACCOMPLISHED BY IMPLEMENTING A LITTER-CONTROL PLAN AND DEVELOPING A HAZARD ANALYSIS AND CRITICAL CONTROL POINT PLAN (HACCP - SEE http://www.hacco-nrm.org/Wizard/default.asp) TO PREVENT ATTRACTION AND INTRODUCTION OF NON-NATIVE SPECIES.

8. FUELING OF PROJECT-RELATED VEHICLES AND EQUIPMENT SHOULD TAKE PLACE AWAY FROM THE WATER AND A CONTINGENCY PLAN TO CONTROL PETROLEUM PRODUCTS ACCIDENTALLY SPILLED DURING THE PROJECT SHALL BE DEVELOPED. ABSORBENT PADS AND CONTAINMENT BOOMS SHALL BE STORED ON-SITE, IF APPROPRIATE, TO FACILITATE THE CLEAN-UP OF ACCIDENTAL PETROLEUM RELEASES.

9. ANY UNDER-LAYER FILLS USED IN THE PROJECT SHALL BE PROTECTED FROM EROSION WITH STONES (OR CORE-LOC UNITS) AS SOON AFTER PLACEMENT AS PRACTICABLE.

10. ANY SOIL EXPOSED NEAR WATER AS PART OF THE PROJECT SHALL BE PROTECTED FROM EROSION (WITH PLASTIC SHEETING, FILTER FABRIC ETC.) AFTER EXPOSURE AND STABILIZED AS SOON AS PRACTICABLE (WITH NATIVE OR NON-INVASIVE VEGETATION MATTING, HYDROSEEDING, ETC.)

GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES (BMPS)

1. STREET SWEEPING AND VACUUMING: ALL POLLUTANTS DISCHARGED FROM THE CONSTRUCTION SITE TO OFF-SITE AREAS MUST BE SWEPT OR VACUUMED EACH DAY BEFORE LEAVING THE JOB SITE.

2. MATERIALS DELIVERY, STORAGE AND USE MANAGEMENT: PREVENT, REDUCE, OR ELIMINATE THE DISCHARGE OF POLLUTANTS FROM MATERIAL DELIVERY, STORAGE, AND USE TO THE STORM WATER SYSTEM OR WATERCOURSES BY MINIMIZING THE STORAGE OF HAZARDOUS MATERIALS ONSITE, STORING MATERIALS IN A DESIGNATED AREA AND INSTALLING SECONDARY CONTAINMENT. CONSTRUCTION MATERIALS, WASTE, TOXIC AND HAZARDOUS SUBSTANCES, STOCKPILES AND OTHER SOURCES OF POLLUTION SHALL NOT BE STORED IN BUFFER AREAS, NEAR AREAS OF CONCENTRATED FLOW, OR AREAS ABUTTING THE STORM SEWER SYSTEM, RECEIVING WATERS, OR DRAINAGE IMPROVEMENTS THAT DISCHARGE OFF-SITE. PRIMARY AND SECONDARY CONTAINMENT CONTROLS AND COVERS SHALL BE IMPLEMENTED TO THE MAXIMUM EXTENT PRACTICABLE.

3. SPILL PREVENTION AND CONTROL: CREATE AND IMPLEMENT SPILL PREVENTION AND RESPONSE PLANS TO ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO THE STORM SEWER SYSTEM AND RECEIVING WATERS FROM LEAKS AND SPILLS BY REDUCING THE CHANCE FOR SPILLS, ABSORBING, CONTAINING, AND CLEANING UP SPILLS AND PROPERLY DISPOSING OF SPILL MATERIALS. AT A MINIMUM, ALL PROJECTS SHALL CLEANUP ALL LEAKS AND SPILLS IMMEDIATELY.

4. SPILL RESPONSE KITS SHALL BE AVAILABLE FOR USE ON-SITE DURING ALL PERIODS OF ACTIVITY WHEN A POTENTIAL EXISTS FOR FUEL, OIL, OR CHEMICAL RELEASE, SUCH AS A LEAK OR SPILL. WORKERS ON-SITE MUST BE KNOWLEDGEABLE CONCERNING SPILL RESPONSE PROCEDURES. ALL SPILLS MUST BE IMMEDIATELY REPORTED TO THE DPW ENVIRONMENTAL SPILL REPORTING HOTLINE AT (808) 656-1111 DURING BUSINESS HOURS OR THE INSTALLATION OPERATIONS CENTER AT (808) 656-3279 FOR AFTER HOURS OR WEEKEND REPORTS.

GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES (BMPS) (CONT.)

5. HAZARDOUS MATERIALS: PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM HAZARDOUS WASTE THROUGH PROPER MATERIAL USE AND WASTE DISPOSAL. IN THE EVENT THAT HAZARDOUS MATERIALS ARE DISCHARGED TO THE STORM SEWER SYSTEM, IMMEDIATELY NOTIFY THE CONTRACTING OFFICER REPRESENTATIVE (COR) OF THE DISCHARGE. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGED, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE COR NO LESS THAN 3 DAYS AFTER NOTIFICATION.

6. NON-HAZARDOUS MATERIALS: IN THE EVENT THAT NON-HAZARDOUS MATERIALS ARE DISCHARGED TO THE STORM SEWER SYSTEM, NOTIFY THE COR NO LATER THAN THE NEXT BUSINESS DAY. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGED, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE COR NO LESS THAN 3 DAYS AFTER NOTIFICATION.

7. VEHICLE AND EQUIPMENT CLEANING: ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT CLEANING OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, WASHING IN DESIGNATED, CONTAINED AREAS ONLY, AND ELIMINATING DISCHARGES TO THE STORM DRAIN SYSTEM BY EVAPORATING AND/OR TREATING WASH WATER, AS APPROPRIATE OR INFILTRATING WASH WATER FOR EXTERIOR CLEANING ACTIVITIES THAT USE WATER ONLY.

8. VEHICLE AND EQUIPMENT FUELING: PREVENT FUEL SPILLS AND LEAKS BY USING OFF-SITE FACILITIES, FUELING ONLY IN DESIGNATED AREAS, ENCLOSING OR COVERING STORED FUEL, AND IMPLEMENTING SPILL CONTROLS SUCH AS SECONDARY CONTAINMENT AND ACTIVE MEASURES USING SPILL RESPONSE KITS.

9. VEHICLE AND EQUIPMENT MAINTENANCE: ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT MAINTENANCE OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, PERFORMING WORK IN DESIGNATED AREAS ONLY, USING SPILL PADS UNDER VEHICLES AND EQUIPMENT, CHECKING FOR LEAKS AND SPILLS, AND CONTAINING AND CLEANING UP SPILLS IMMEDIATELY.

10. SOLID WASTE MANAGEMENT: PREVENT OR REDUCE DISCHARGE OF POLLUTANTS TO THE LAND, GROUNDWATER, AND IN STORM WATER FROM SOLID WASTE OR CONSTRUCTION AND DEMOLITION WASTE BY PROVIDING DESIGNATED WASTE COLLECTION AREAS, COLLECT SITE TRASH DAILY, AND ENSURING THAT CONSTRUCTION WASTE IS COLLECTED, REMOVED AND DISPOSED OF ONLY AT AUTHORIZED DISPOSAL AREAS.

11. SANITARY/SEPTIC WASTE MANAGEMENT: TEMPORARY AND PORTABLE SANITARY AND SEPTIC WASTE SYSTEMS SHALL BE MOUNTED OR STAKED IN, WELL-MAINTAINED AND SCHEDULED FOR REGULAR WASTE DISPOSAL AND SERVICING. SOURCES OF SANITARY AND/OR SEPTIC WASTE SHALL NOT BE STORED NEAR THE STORM SEWER SYSTEM OR RECEIVING WATERS.

12. STOCKPILE MANAGEMENT: STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS, WITHIN 50 FEET FROM AREAS OF CONCENTRATED FLOWS, AND ARE NOT ALLOWED IN THE ROAD. SEDIMENT BARRIERS, SILT FENCES OR BIOFILTER SOCKS SHALL BE USED AROUND THE BASE OF ALL STOCKPILES. STOCKPILES SHALL NOT EXCEED 15 FEET IN HEIGHT. STOCKPILES GREATER THAN 15 FEET IN HEIGHT SHALL REQUIRE 8 FOOT WIDE BENCHES AT 15 FOOT INCREMENTS. STOCKPILES MUST BE COVERED WITH PLASTIC SHEETING OR A COMPARABLE MATERIAL IF THEY WILL NOT BE ACTIVELY USED WITHIN 7 DAYS.

13. LIQUID WASTE MANAGEMENT: LIQUID WASTE SHALL BE CONTAINED IN A CONTROLLED AREA SUCH AS A HOLDING PIT, SEDIMENT BASIN, ROLL-OFF BIN, OR PORTABLE TANK OF SUFFICIENT VOLUME AND TO CONTAIN THE LIQUID WASTE GENERATED. CONTAINMENT AREAS OR DEVICES MUST BE IMPERMEABLE AND LEAK FREE AND SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS.

14. CONCRETE WASTE MANAGEMENT: PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM CONCRETE WASTE BY CONDUCTING WASHOUT OFFSITE OR PERFORMING ONSITE WASHOUT IN A DESIGNATED AREA CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. PLASTIC LINING MATERIALS SHALL BE A MINIMUM OF 10 MILLIMETERS POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL. CONTAINMENT AREAS OR DEVICES SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75 PERCENT FULL. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED AND DISPOSED OF AS SOLID WASTES.

15. CONTAMINATED SOIL MANAGEMENT: AT MINIMUM CONTAIN CONTAMINATED MATERIAL SOIL BY SURROUNDING WITH IMPERMEABLE LINED BERMS OR COVER EXPOSED CONTAMINATED MATERIAL WITH PLASTIC SHEETING. CONTAMINATED SOIL SHOULD BE DISPOSED OF PROPERLY IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.

16. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS AS REFLECTED ON PLANS SHALL BE IN PLACE BEFORE ANY WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

17. ALL CONTROL MEASURES SHALL BE CHECKED DAILY AND REPAIRED AS NECESSARY.

18. CONTRACTOR SHALL OBSERVE AND COMPLY WITH THE STATE DEPARTMENT OF HEALTH REGULATIONS REGARDING STORM WATER DISCHARGE.

19. DUST CONTROL SHALL BE APPLIED TO REDUCE DUST EMISSIONS. THE CONTRACTOR, AT HIS OR HER OWN EXPENSE, SHALL KEEP THE PROJECT AREAS AND SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH AIR POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES: CHAPTER 11-60, "AIR POLLUTION CONTROL." CONTRACTOR SHOULD KEEP THE OPEN SITE WATERED DURING CONSTRUCTION HOURS.

20. THE CONTRACTOR SHALL ENSURE THAT ALL TIRES OF CONSTRUCTION VEHICLES ARE SUFFICIENTLY CLEANED OFF SO THAT DIRT OR DEBRIS IS NOT TRACKED OFF THE CONSTRUCTION SITE. WASHING OFF TIRES WITH WATER WILL NOT BE ACCEPTABLE UNLESS THE RUNOFF IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM.

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DRAWN BY: S. CARREIRA-PUAHALA
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SUBMITTED BY: M. FUJIOKA
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

EROSION AND SEDIMENT CONTROL NOTES - 1

SHEET ID
CG001

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RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

PROJECT SEQUENCE

1. INSTALL PERIMETER CONTROLS, SILT FENCE, AND STABILIZED CONSTRUCTION ENTRANCE.
2. CONSTRUCT COSA AND DEWATERING AREAS.
3. INSTALL TURBIDITY CURTAIN.
4. DREDGING AND IN-WATER WORK MAY BEGIN.
5. RELOCATE, RECONSTRUCT AND MAINTAIN BMPS AS NEEDED TO KEEP THEM EFFECTIVE AT ALL TIMES. INITIATE TEMPORARY STABILIZATION IMMEDIATELY ONCE GRADING IS COMPLETED.
6. INITIATE STABILIZATION OF STEEP SLOPES (>15%) WITH HYDROSEEDING AS SOON AS GRADING IS COMPLETED ON THOSE AREAS.
7. PROCEED WITH CONSTRUCTION WITH LEAST POSSIBLE DISTURBANCE OF VEGETATIVE AREAS AND TEMPORARY STRUCTURES.
8. PLANT PERMANENT GROUND COVER INCLUDING COSA AND DEWATERING AREAS AS SOON AS POSSIBLE.
9. REMOVE OR DISMANTLE TEMPORARY EROSION CONTROL STRUCTURES AFTER FULL ESTABLISHMENT OF PERMANENT VEGETATIVE COVER.
10. PRACTICE GOOD HOUSEKEEPING MEASURES THROUGHOUT THE DURATION OF CONSTRUCTION.

RAIN RESPONSE PLAN

THE FOLLOWING WILL BE PERFORMED WHEN HEAVY RAINS, STORM OR HURRICANE IS IMMINENT OR IS FORECASTED IN THE NEXT 48 HOURS:

1. TEMPORARY SUSPENSION OF ACTIVE GRADING, GRUBBING, TRENCHING, AND DREDGING OPERATIONS.
2. INSPECT PERIMETER CONTROLS, TURBIDITY CURTAINS, AND INLET PROTECTION DEVICES, AND MAINTAIN AS NEEDED. REINSTALL ANY PERIMETER CONTROLS THAT WERE REMOVED DUE TO ACTIVE WORK IN THE AREA. IF A SEVERE STORM IS EXPECTED, REMOVE INLET PROTECTION DEVICES TO PREVENT FLOODING ON SURROUNDING STREETS AND REMOVE TURBIDITY CURTAINS TO PREVENT FROM BEING WASHED AWAY.
3. COVER OR RELOCATE MATERIAL STOCKPILES AND LIQUID MATERIAL CONTAINERS TO AVOID CONTACT WITH RAINWATER.
4. PLACE SPILL PANS OR OILY-ONLY SPILL PADS UNDER CONSTRUCTION VEHICLES TO PREVENT RUNOFF FROM CONTACTING ANY SPILLED PETROLEUM PRODUCTS. PROPERLY DISPOSE OF ANY ACCUMULATED OILY WATER AFTER THE RAIN EVENT.
5. RE-INSPECT AFTER THE HEAVY RAINS, STORM OR HURRICANE HAVE PASSED, AND REPLACE OR MAINTAIN PERIMETER CONTROLS, TURBIDITY CURTAINS, INLET PROTECTION, AND ANY OTHER BMPS AS NEEDED.

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SUBMITTED BY: M. FUJIOKA	
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KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

EROSION AND SEDIMENT CONTROL NOTES - 2

SHEET ID

CG002

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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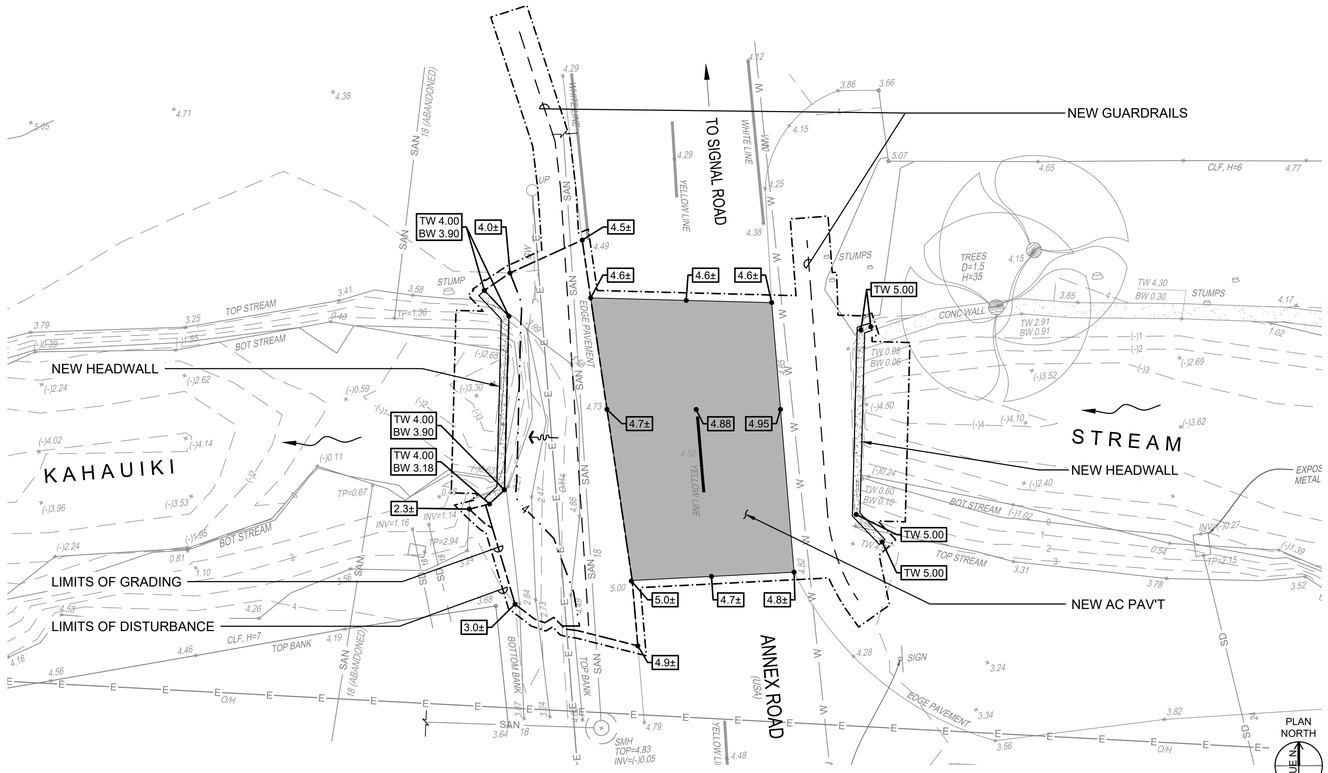

G1 KAHAUIKI B - GRADING PLAN (BID OPTION 1)

SCALE: 1" = 10'

10' 0 10' 20'

NOTE:

1. SEE SHEET C-105 FOR KAHAUIKI STREAM B (BID OPTION 1) SITE PLAN.

LEGEND:

- EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR
- BID OPTION 1 LIMITS OF DISTURBANCE
- LIMITS OF GRADING
- PROPOSED MINOR CONTOUR
- NEW GUARDRAIL
- 5.0± NEW SPOT ELEVATION TO MATCH EXIST.
- TW 5.00 TOP OF WALL ELEVATION
- BW 3.00 BOTTOM OF WALL ELEVATION

GRADING QUANTITIES	
EXCAVATION	1 CY CUT
EMBANKMENT	14 CY FILL
NET EARTHWORK	13 CY FILL
DISTURBED AREA	2,617 SF

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GRADING PLAN (BID OPTION 1)

SHEET ID
CG101

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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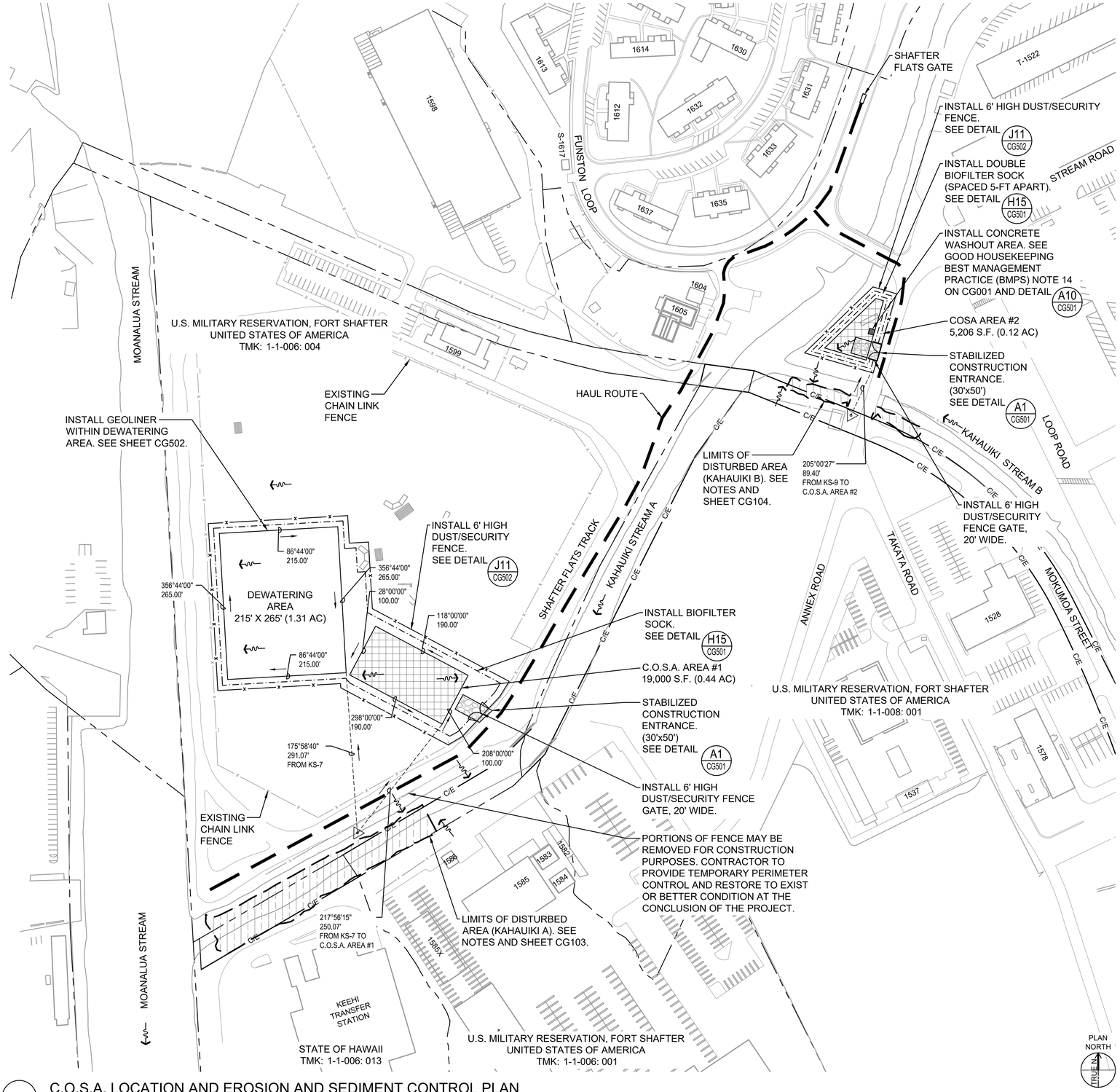


A1 C.O.S.A. LOCATION AND EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1" = 100'

C.O.S.A. NOTES:

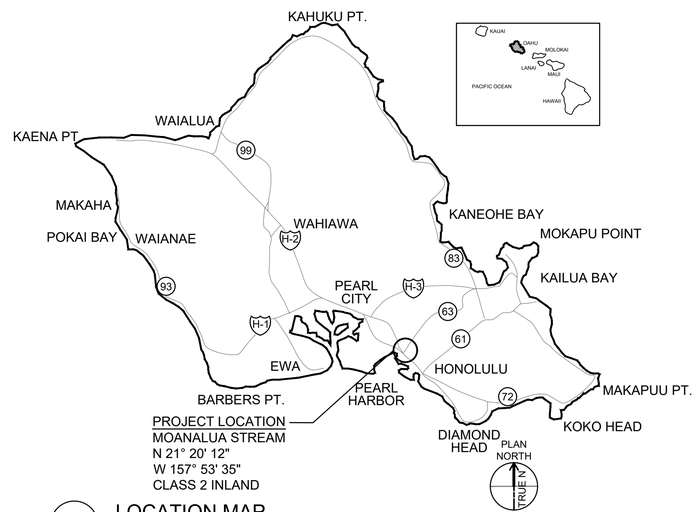
1. AN NPDES PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITES, PER HAR 11-55 APPENDIX C, HAS BEEN OBTAINED FOR THIS PROJECT. IF THERE ARE UNFORESEEN CONDITIONS THAT REQUIRE THE PROJECT SCOPE/AREA TO BE REVISED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COR. IF THE CONTRACTOR DESIRES ADDITIONAL AREA FOR LARGER C.O.S.A., THE CONTRACTOR SHALL COORDINATE WITH THE COR AND DOH AT NO ADDITIONAL COST TO THE GOVERNMENT INCLUDING LABOR, FEES, AND SCHEDULE DELAYS RELATED TO REVISING THE PERMIT.
2. PARKING FOR CONTRACTOR AND SUBCONTRACTOR EMPLOYEE VEHICLES SHALL BE LIMITED TO THE C.O.S.A. AREA. CONTRACTOR AND SUBCONTRACTOR EMPLOYEE VEHICLES WILL NOT BE ALLOWED TO PARK ANYWHERE ELSE UNLESS OTHERWISE APPROVED BY DPW.
3. AT END OF CONSTRUCTION, COORDINATE WITH COR AND DPW TO RESTORE C.O.S.A. AND DEWATERING AREA TO EXISTING OR BETTER CONDITION, INCLUDING BUT NOT LIMITED TO PAVEMENT AND LANDSCAPING.

NOTES:

1. TOTAL DISTURBED AREA : 115,749 S.F. (2.66 AC)
   - IMPROVEMENTS (KAHAUIKI A): 27,653 S.F. (0.63 AC)
   - IMPROVEMENTS (KAHAUIKI B): 6,915 S.F. (0.16 AC)
   - C.O.S.A. 1: 19,000 S.F (0.44 AC)
   - C.O.S.A. 2: 5,206 S.F (0.12 AC)
   - DEWATERING AREA: 56,975 S.F. (1.31 AC)
2. SEE EROSION AND SEDIMENT CONTROL NOTES - 1 ON SHEET CG001, C.O.S.A. LOCATION AND EROSION AND SEDIMENT CONTROL PLAN ON SHEET CG102, EROSION AND SEDIMENT CONTROL DETAILS ON SHEETS CG501 AND CG502, AND SPECIFICATION SECTION 01 57 19 - TEMPORARY ENVIRONMENTAL CONTROLS FOR ADDITIONAL REQUIREMENTS.
3. ALL SEWER MANHOLES SHALL BE KEPT CLEAR TO MAINTAIN ACCESS AT ALL TIMES.
4. CONTRACTOR SHALL ATTACH DUST SCREEN FABRIC TO TEMPORARY CHAIN LINK FENCING.

LEGEND:

- DREDGED AREA / LIMITS
- C.O.S.A. AREA
- CONSTRUCTION ENTRANCE
- HAUL ROUTE
- DUST/SECURITY FENCE
- BIOFILTER SOCK (PERIMETER PROTECTION)
- FLOW DIRECTION



PROJECT LOCATION
MOANALUA STREAM
N 21° 20' 12"
W 157° 53' 35"
CLASS 2 INLAND

B15 LOCATION MAP

SCALE: NTS

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DESIGNED BY: B. AKEDO
DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
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C.O.S.A. LOCATION AND EROSION AND SEDIMENT CONTROL PLAN

SHEET ID
CG102

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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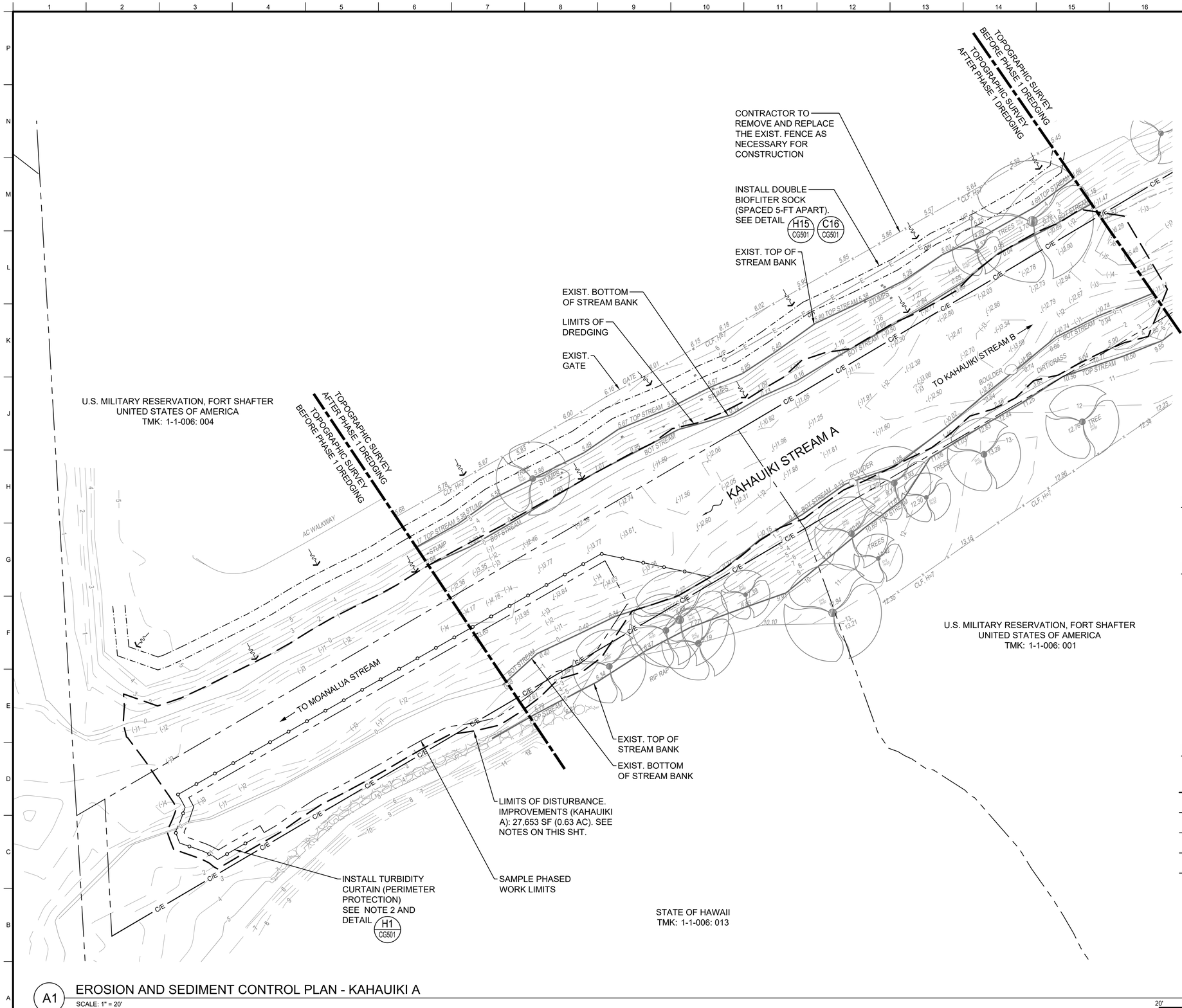

A1 EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI A

SCALE: 1" = 20'

NOTE:

1. CONTRACTOR SHALL WORK FROM THE NORTH SIDE OF THE STREAM.

ESCP SEQUENCING NOTES:

1. CONTRACTOR SHALL PHASE THEIR DREDGING OPERATION TO APPROXIMATELY HALF OF THE STREAM WIDTH AT A TIME.
2. TURBIDITY CURTAIN SHALL BE INSTALLED AROUND DREDGING LIMITS SUCH THAT THE REMAINING STREAM WIDTH WILL REMAIN UNOBSTRUCTED.
3. EACH PHASE SHALL BE COMPLETED BEFORE THE NEXT PHASE IS INITIATED.
4. CONTRACTOR SHALL ENSURE TURBIDITY CURTAIN DURING CURRENT PHASE IS REMOVED WITH MINIMAL DISTURBANCE OF SEDIMENT DEPOSITS PRIOR TO INSTALLING BMPS FOR NEXT PHASE.

LEGEND:

- FLOW DIRECTION
- LIMITS OF DREDGING AND DISTURBED AREA
- C/E — EASEMENT
- PROPERTY LINE
- TURBIDITY CURTAIN (PERIMETER PROTECTION)
- BIOFILTER SOCK (PERIMETER PROTECTION)

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EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI A

SHEET ID
CG103

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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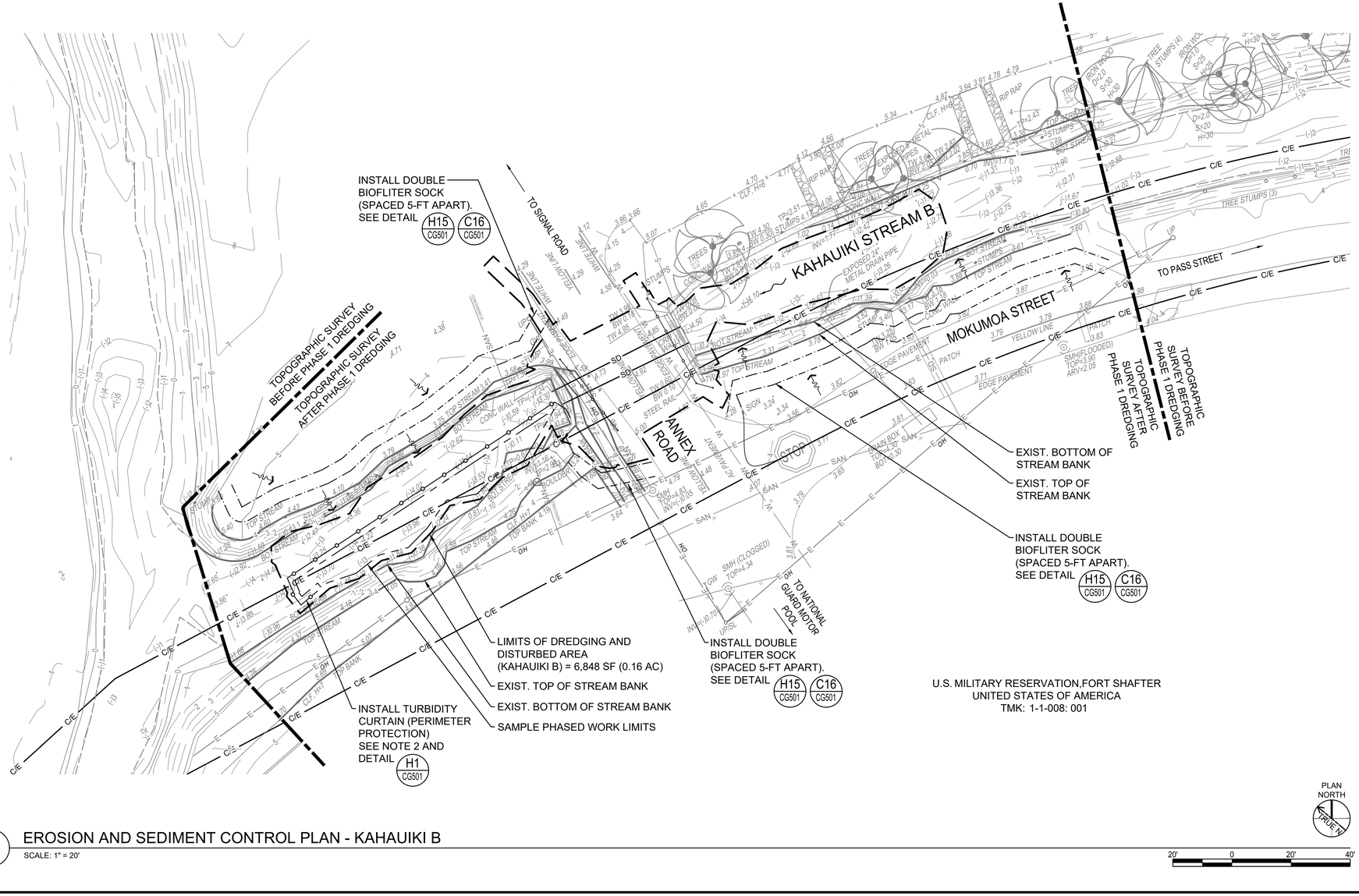

NOTE:

1. CONTRACTOR SHALL WORK FROM THE NORTH SIDE OF THE STREAM WEST OF ANNEX ROAD AND FROM THE SOUTH SIDE OF THE STREAM EAST OF ANNEX ROAD.

ESCP SEQUENCING NOTES:

1. CONTRACTOR SHALL PHASE THEIR DREDGING OPERATION TO APPROXIMATELY HALF OF THE STREAM WIDTH AT A TIME.
2. TURBIDITY CURTAIN SHALL BE INSTALLED AROUND DREDGING LIMITS SUCH THAT THE REMAINING STREAM WIDTH WILL REMAIN UNOBSTRUCTED.
3. EACH PHASE SHALL BE COMPLETED BEFORE THE NEXT PHASE IS INITIATED.
4. CONTRACTOR SHALL ENSURE TURBIDITY CURTAIN DURING CURRENT PHASE IS REMOVED WITH MINIMAL DISTURBANCE OF SEDIMENT DEPOSITS PRIOR TO INSTALLING BMPS FOR NEXT PHASE.

LEGEND:

- FLOW DIRECTION
- LIMITS OF DREDGING AND DISTURBED AREA
- C/E — EASEMENT
- PROPERTY LINE
- TURBIDITY CURTAIN (PERIMETER PROTECTION)
- BIOFILTER SOCK (PERIMETER PROTECTION)

A1 EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI B

SCALE: 1" = 20'

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EROSION AND SEDIMENT CONTROL PLAN - KAHAUIKI B

SHEET ID

CG104

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Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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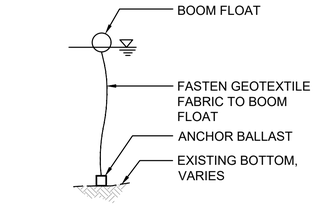
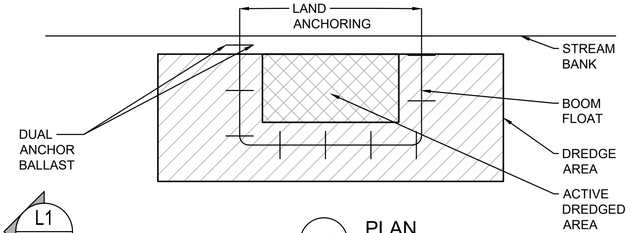


L1 SECTION
SCALE: NTS



L7 PLAN
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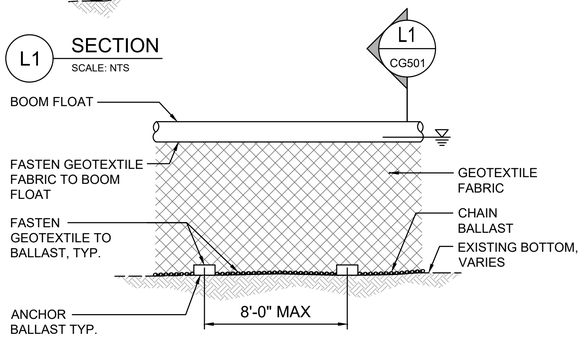


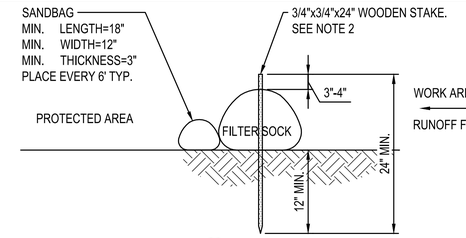
H3 ELEVATION
SCALE: NTS

NOTES:

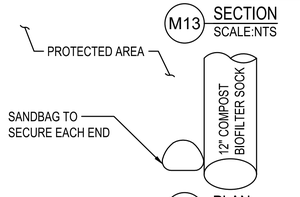
1. TURBIDITY CURTAIN SHALL COMPLETELY ENCLOSE THE DREDGING OPERATIONS AND REMAIN IN PLACE UNTIL CONSTRUCTION RELATED TURBIDITY HAS RETURNED TO AMBIENT LEVEL.
2. DREDGING WORKS SHALL STOP IMMEDIATELY IF SILT CURTAIN IS FOUND DAMAGED. WORK MAY RESUME AFTER REPAIRING OR REPLACING OF DAMAGED SILT CURTAINS.
3. INSTALL BOOM FLOAT, GEOTEXTILE FABRIC, CHAIN BALLAST, ANCHOR BALLAST, AND LAND ANCHORING PER MANUFACTURER RECOMMENDATIONS.
4. TURBIDITY CURTAIN NOT TO EXTEND MORE THAN APPROXIMATELY HALF THE STREAM CHANNEL AT ANY TIME.

TABLE 1 - TURBIDITY CURTAIN REQUIREMENTS	
PARAMETER	REQUIRED VALUE
SKIRT LENGTH	UP TO 100 FT MAXIMUM.
FABRIC	
TENSILE STRENGTH GRAB	500 LB/IN.
TEAR STRENGTH STRIP 22OZ	400 LB
ABRASION RESISTANCE	200 LB/IN. TENSILE STRENGTH AFTER ABRASION
MATERIAL	POLYESTER
COATING	PVC
WEIGHT	22OZ
SEAMS	HEAT SEALED
BUOYANCY	
RATIO	>5
TYPE	SOLID, CLOSED CELL, AND ENCLOSED IN A FABRIC POCKET
CONNECTOR	LOAD TRANSFER TYPE - ALUMINUM EXTRUSION
BALLAST	
TYPE	NONCORROSIVE GALVANIZED CHAIN
WEIGHT	0.9 LB/FT
TENSION MEMBER	
CURRENT (0.1-1.0 KNOTS)	TOP OR CENTER TENSION; CENTER TENSION PROVIDES SLIGHTLY GREATER EFFECTIVE SKIRT DEPTH.

H1 TURBIDITY CURTAIN BARRIER DETAIL
SCALE: NTS



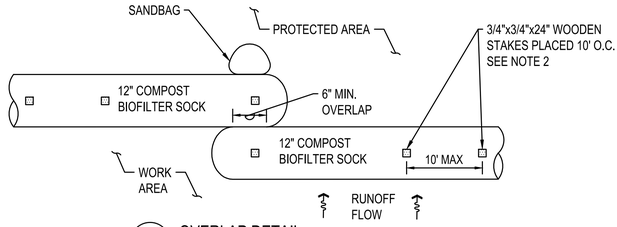
M13 SECTION
SCALE:NTS



L13 PLAN
SCALE:NTS

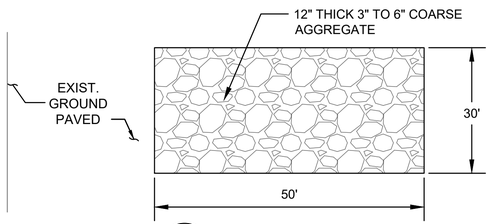
NOTES:

1. LOOSE FILTER MEDIA MAY BE BACKFILLED ON THE UPSLOPE SIDE OF SOCK TO ENHANCE PERFORMANCE.
2. DO NOT INSTALL WOODEN STAKES IF BIOFILTER SOCK IS PLACED ON PAV'T

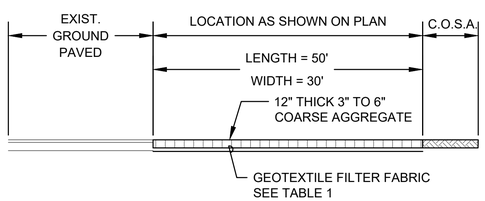


H12 OVERLAP DETAIL
SCALE:NTS

H15 BIOFILTER SOCK DETAIL
SCALE: NTS



E2 PLAN
SCALE: NTS



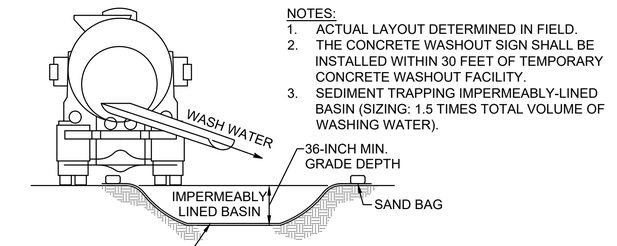
B2 SECTION
SCALE: NTS

TABLE 1- CG501: GEOTEXTILE REQUIREMENTS			
MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE
TENSILE STRENGTH (AT 2% STRAIN)	ASTM D4595	LBS/FT	600 (MD) - 660(CD)
TENSILE STRENGTH (AT 5% STRAIN)	ASTM D4595	LBS/FT	1620 (MD) - 1632(CD)
GRAB TENSILE STRENGTH	ASTM D4632	LBS	450 (MD) - 320(CD)
GRAB TENSILE ELONGATION	ASTM D4632	%	12 (MD) - 10(CD)
TRAPEZOID TEAR STRENGTH	ASTM D4533	LBS	150 (MD) - 160(CD)
CBR PUNCTURE STRENGTH	ASTM D6241	LBS	1300
			MAXIMUM OPENING SIZE
APPARENT OPENING SIZE (AOS)	ASTM D4751	U.S. SIEVE	40
			MINIMUM ROLL VALUE
PERMITTIVITY	ASTM D4491	SEC^{-1}	0.9
FLOW RATE	ASTM D4491	$GAL/MIN/FT^2$	70
			TYPICAL ROLL VALUE
PORE SIZE O_{95}	ASTM D6767	MICRONS	360
PORE SIZE O_{50}	ASTM D6767	MICRONS	220
			MINIMUM TEST VALUE
UV RESISTANCE (AT 500 HOURS)	ASTM D4355	% STRENGTH RETAINED	90
INTERACTION COEFFICIENT (FOR SAND OR GRAVEL)	ASTM D6706	- -	0.89
FACTORY SEWN SEAM	ASTM D4884	LBS/FT	2400

NOTES:

1. UPON REMOVAL OF STABILIZED CONSTRUCTION ENTRANCE, PERMANENTLY STABILIZE DISTURBED AREA WITH VEGETATIVE COVERING.
2. SEE SHEET G-005 C.O.S.A. NOTE 6.

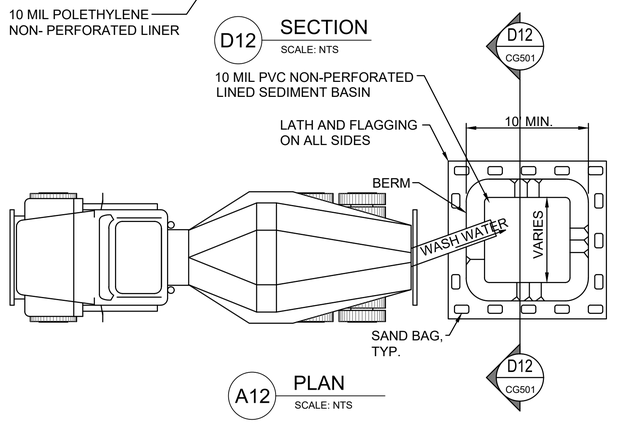
A1 STABILIZED CONSTRUCTION ENTRANCE DETAIL
SCALE: NTS



NOTES:

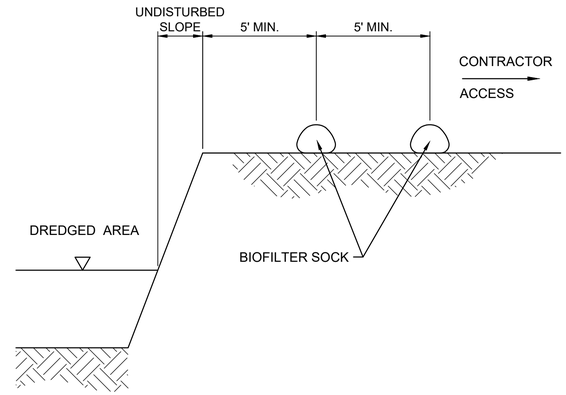
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FEET OF TEMPORARY CONCRETE WASHOUT FACILITY.
3. SEDIMENT TRAPPING IMPERMEABLY-LINED BASIN (SIZING: 1.5 TIMES TOTAL VOLUME OF WASHING WATER).

D12 SECTION
SCALE: NTS



A12 PLAN
SCALE: NTS

A10 CONCRETE TRUCK DRUM CHUTE WASH WATER SEDIMENT BASIN DETAIL
SCALE: NTS



C16 BIOFILTER SOCK INSTALLATION DETAIL
SCALE: NTS

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DRAWN BY: S. CARREIRA-PUAHALA
CHECKED BY: M. FUJIOKA
SUBMITTED BY: M. FUJIOKA
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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

EROSION AND SEDIMENT CONTROL DETAILS - 1

SHEET ID
CG501

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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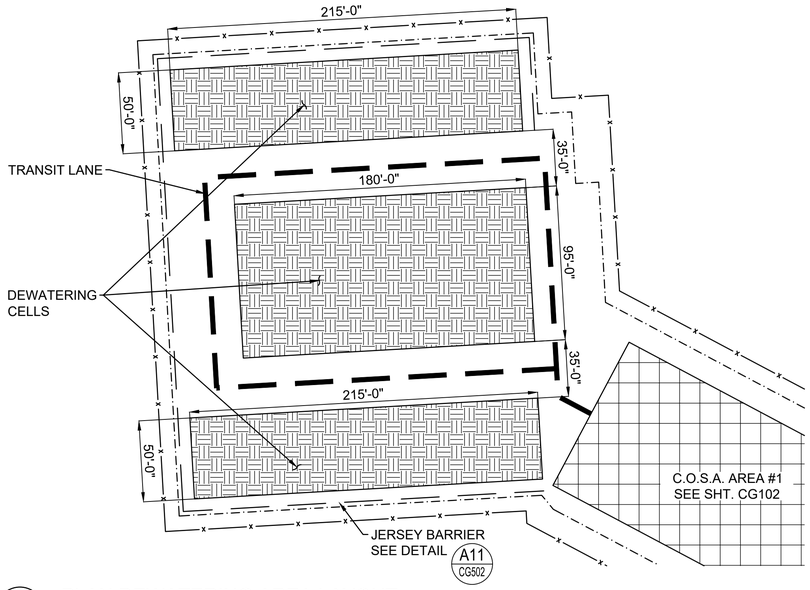
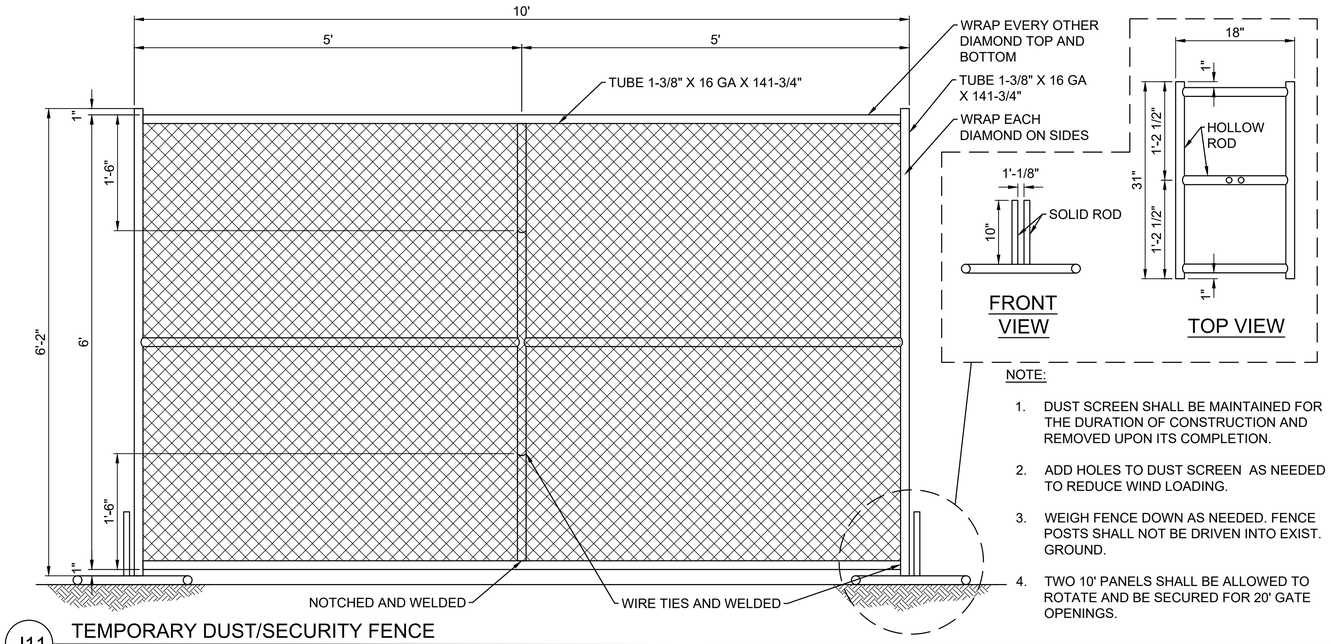


J1 PLAN DEWATERING AREA LAYOUT

SCALE: NTS



NOTE:

1. DUST SCREEN SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION AND REMOVED UPON ITS COMPLETION.
2. ADD HOLES TO DUST SCREEN AS NEEDED TO REDUCE WIND LOADING.
3. WEIGH FENCE DOWN AS NEEDED. FENCE POSTS SHALL NOT BE DRIVEN INTO EXIST. GROUND.
4. TWO 10' PANELS SHALL BE ALLOWED TO ROTATE AND BE SECURED FOR 20' GATE OPENINGS.

J11 TEMPORARY DUST/SECURITY FENCE

SCALE: NTS

PROPERTIES	TEST METHOD	0.75 MM (30 MIL)
THICKNESS – MILS (MIN. AVE)	D 5199	nom. (mil) – 10%
LOWEST INDIVIDUAL OF 10 VALUES		
DENSITY (MIN)	D 1505/D 792	0.940 g/cc
TENSILE PROPERTIES (I) (MIN. AVE)	D 6693	
YIELD STRENGTH	Type IV	11 kN/m
BREAK STRENGTH		20 kN/m
YIELD ELONGATION		12%
BREAK ELONGATION		700%
TEAR RESISTANCE (MIN. AVE.)	D 1004	93 N
PUNCTURE RESISTANCE (MIN. AVE)	D 4833	240 N
STRESS CRACK RESISTANCE (2)	D 5397 (APP.)	500 hr.
CARBON BLACK CONTENT - %	D 4218 (3)	2.0-3.0%
CARBON BLACK DISPERSION	D 5596	NOTE (4)
OXIDATIVE INDUCTION TIME (OIT) (MIN. AVE.) (5)		
(A) STANDARD OIT	D 3895	100 min
-OR-		
(B) HIGH PRESSURE OIT	D 5885	400 min
OVEN AGING AT 85°C (5), (6)	D 5721	
(A) STANDARD OIT (MIN. AVE.) - % RETAINED AFTER 90 DAYS	D 3895	55%
-OR-		
(B) STANDARD OIT (MIN. AVE.) - % RETAINED AFTER 90 DAYS	D 5885	80%
UV RESISTANCE (7)	D 7238	
(A) STANDARD OIT (MIN. AVE.)	D 3895	N. R. (8)
-OR-		
(B) HIGH PRESSURE OIT (MIN. AVE.) - % RETAINED AFTER 1600 HRS (9)	D5885	50%

NOTE:

(1) MACHINE DIRECTION (MD) AND CROSS MACHINE DIRECTION (XMD) AVERAGE VALUES SHOULD BE ON THE BASIS OF 5 TEST SPECIMENS EACH DIRECTION
- YIELD ELONGATION IS CALCULATED USING A GAGE LENGTH OF 33 MM
- BREAK ELONGATION IS CALCULATED USING A GAGE LENGTH OF 50 MM

(2) THE YIELD STRESS USED TO CALCULATE THE APPLIED LOAD FOR THE SP-NCTL TEST SHOULD BE THE MANUFACTURER'S MEAN VALUE VIA MQC TESTING.

(3) OTHER METHODS SUCH AS D 1603 (TUBE FURNACE) OR D 6370 (TGA) ARE ACCEPTABLE IF AN APPROPRIATE CORRELATION TO D 4218 (MUFFLE FURNACE) CAN BE ESTABLISHED.

(4) CARBON BLACK DISPERSION (ONLY NEAR SPHERICAL AGGLOMERATES) FOR 10 DIFFERENT VIEWS:
- 9 IN CATEGORIES 1 OR 2 AND 1 IN CATEGORY 3

(5) THE MANUFACTURER HAS THE OPTION TO SELECT EITHER ONE OF THE OIT METHODS LISTED TO EVALUATE THE ANTIOXIDANT CONTENT IN THE GEOMEMBRANE.

(6) IT IS ALSO RECOMMENDED TO EVALUATE SAMPLES AT 30 AND 60 DAYS TO COMPARE WITH THE 90 DAY RESPONSE.

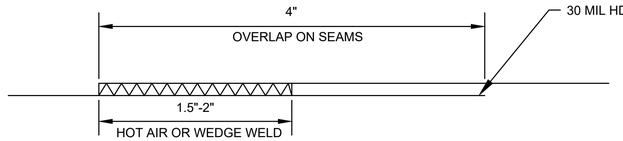
(7) THE CONDITION OF THE TEST SHOULD BE 20 HR. UV CYCLE AT 75°C FOLLOWED BY 4 HR. CONDENSATION AT 60°C.

(8) NOT RECOMMENDED SINCE THE HIGH TEMPERATURE OF THE STD-OIT TEST PRODUCES AN UNREALISTIC RESULT FOR SOME OF THE ANTIOXIDANTS IN THE UV EXPOSED SAMPLES.

(9) UV RESISTANCE IS BASED ON PERCENT RETAINED VALUE REGARDLESS OF THE ORIGINAL HP-OIT VALUE.

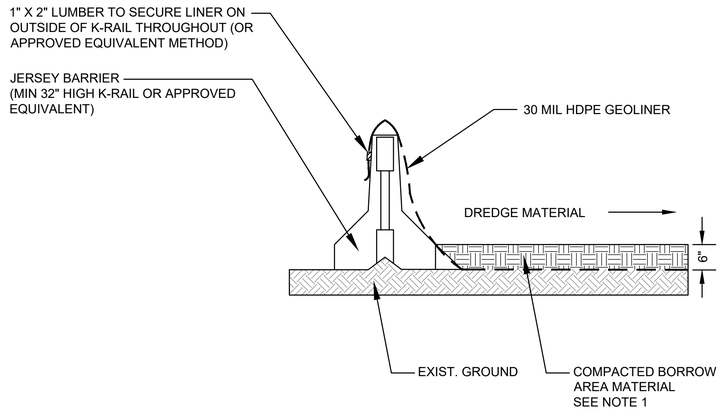
C1 GEOLINER PROPERTIES

SCALE: NTS



G11 TYPICAL FIELD SEAM SECTION

SCALE: NTS



NOTE:

1. FILL LAYERS TO BE PLACED AND COMPACTED TO AT LEAST 90 PERCENT OF THE LABORATORY MAXIMUM DRY DENSITY FOR THE FILL MATERIAL PER ASTM D1557 TEST METHOD.
2. THE CONTRACTOR SHALL DISPOSE OF SURPLUS DREDGE MATERIAL DRIES, PER SPECIFICATION SECTION 31 00 00.

A11 TYPICAL DEWATERING AREA SECTION

SCALE: NTS

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SUBMITTED BY: M. FUJIOKA
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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

EROSION AND SEDIMENT CONTROL DETAILS - 2

SHEET ID
CG502

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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TRAFFIC CONTROL NOTES:

1. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATIVE RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAYS ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI-TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."

2. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POST AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES.

3. CONTRACTOR SHALL HIRE A LICENSED CIVIL ENGINEER WITH A MINIMUM FIVE (5) YEARS TRAFFIC CONTROL/ENGINEERING DESIGN EXPERIENCE TO PREPARE TRAFFIC CONTROL AND PHASING PLANS FOR ALL PROPOSED ROAD AND/OR PARKING LOT CLOSURES.

   A. TRAFFIC CONTROL PLAN SHALL BE DONE IN ACCORDANCE WITH THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 6 TEMPORARY TRAFFIC CONTROL" (LATEST EDITION) AND TRAFFIC CONTROL PLAN NOTES.

   B. FOUR (4) COPIES OF CONTRACTOR PROPOSED TRAFFIC CONTROL & PHASING PLANS SHALL BE SUBMITTED FOR GOVERNMENT APPROVAL IN ACCORDANCE WITH SPECIFICATION SECTION 01 33 00. SUBMITTAL AND APPROVAL OF TRAFFIC CONTROL PLANS SHALL BE OBTAINED IN SUFFICIENT TIME TO ALLOW A MINIMUM OF 30 DAYS WRITTEN NOTICE TO THE CONTRACTING OFFICER'S REPRESENTATIVE (COR) PRIOR TO CLOSURE OF ANY EXISTING ROAD/LANE AND/OR EXISTING AC PAVEMENT PARKING LOT IN ACCORDANCE WITH SPECIFICATION SECTION 01 33 00.

   C. CONTRACTOR'S TRAFFIC ENGINEER SHALL REVIEW AND APPROVE THE INSTALLATION OF TRAFFIC CONTROL DEVICES TO BE USED FOR ROAD CLOSURE.

   D. CONTRACTOR SHALL PREPARE, COORDINATE, AND OBTAIN A DPW TRAFFIC CONTROL PLAN PERMIT PRIOR TO COMMENCING ANY ROAD/LANE CLOSURE ACTIVITIES ON THE INSTALLATION. APPROVAL OF PROPOSED ROAD/LANE AND/OR PARKING LOT CLOSURES SHALL BE OBTAINED FROM DPW MASTER PLANNER AND OAHU BASE SUPPORT.

4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ADVANCE NOTIFICATIONS AND COORDINATION AS REQUIRED BY THE TRAFFIC CONTROL PERMIT PROCEDURES AND REQUIREMENTS. COORDINATE WITH COR TO CONFIRM NOTIFICATIONS AND COORDINATION HAVE BEEN COMPLETED PRIOR TO ANY ROAD/LANE CLOSURE ACTIVITIES.

5. TRAFFIC CONTROL PLAN SHALL ENSURE THAT VEHICULAR AND PEDESTRIAN ACCESS IS MAINTAINED AT ALL TIMES TO ALL EXISTING BUILDINGS.

6. ROAD/PARKING LOT CLOSURE REQUIREMENTS:

   A. ONLY ONE SECTION OF ROADWAY SHALL BE ALLOWED TO BE CLOSED OFF AT ONE TIME FOR PARKING LOT CONSTRUCTION WORK. PROPOSED DETOUR ROUTES FOR ALL ROAD CLOSURES SHALL BE SUBMITTED WITH THE CONTRACTOR'S TRAFFIC CONTROL PLAN. BOTH PLANS SHALL BE APPROVED BY THE CONTRACTING OFFICER.

   B. FOR ALL UTILITY AND OTHER WORK AFFECTING EXISTING ROADS: NO MORE THAN ONE BLOCK OF ROADWAY SHALL BE BLOCKED OFF AT ONE TIME AND ONE LANE OF TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. FLAG MEN SHALL BE USED, AS REQUIRED, TO DIRECT TRAFFIC AROUND THE WORK SITE.

   C. ALL ROADS AND PARKING LOTS REQUIRING CLOSURE TO FACILITATE CONSTRUCTION OPERATIONS SHALL BE REOPENED AT THE END OF EACH WORK DAY.

   D. MAIN GATE ACCESS MUST BE MAINTAINED AT ALL TIMES.

7. THE CONTRACTOR SHALL OBTAIN ALL THE REQUIRED APPROVALS PRIOR TO START OF CONSTRUCTION.

8. CONTRACTOR SHALL PROVIDE THE APPROPRIATE NUMBER OF FLAG MEN, EQUIPPED WITH THE PROPER SAFETY CLOTHING, EQUIPMENT, AND/OR COMMUNICATION DEVICES TO CONDUCT, CONTROL, AND MANAGE THE TRAFFIC ENTERING CONTRACTOR WORK SITE.

9. CONTRACTOR SHALL PROVIDE THE APPROPRIATE NUMBER OF ROAD SIGNS, I.E. ROAD CLOSED, DETOUR SIGNS, INFORMATION SIGNS OF UPCOMING AND/OR DURATION OF ROAD/LANE CLOSURE SIGNS TO PROPERLY ADVISE AND REROUTE THE INCOMING TRAFFIC AWAY FROM THE CONSTRUCTION SITE AND ALLOW FOR LOCAL TRAFFIC SERVICE INTO THE CONSTRUCTION AREAS.

10. CLOSURE OF MAJOR ROADWAYS, INTERSECTIONS, AND BASE ENTRANCES WILL REQUIRE THE CONTRACTOR TO PROVIDE SEVERAL ELECTRONIC MESSAGE BOARDS SURROUNDING THE CONSTRUCTION SITE AND SIGNS POSTED A MINIMUM OF 30 DAYS IN ADVANCE OF THE CLOSURE WORK.

11. IN THE EVENT THE REQUESTED LANE/ROAD CLOSURE NEEDS TO BE EXTENDED DUE TO UNFORESEEN WORK, ADVERSE WEATHER, ETC., THE CONTRACTOR SHALL SUBMIT IN WRITING A MINIMUM TWO (2) WEEKS PRIOR TO THE PERMIT EXPIRATION DATE TO SEEK A PERMIT EXTENSION FROM DPW TRAFFIC ENGINEER, KENNETH NAKASHIMA, (808) 656-1965.

12. TRAFFIC CONTROL PERMIT SHALL BE RENEWED ONE YEAR FROM THE START DATE OF THE PERFORMANCE PERIOD (POP), AND ANNUALLY THEREAFTER.

TRAFFIC CONTROL NOTES (CONT.):

13. CONTRACTOR TRAFFIC CONTROL PROCEDURE SHALL INCORPORATE THE FOLLOWING:

   A. A MINIMUM ROADWAY WIDTH OF 10 FEET SHALL BE OPEN AT ALL TIMES.

   B. AT THE END OF EACH DAY'S WORK OR AS SOON AS THE WORK IS COMPLETED, THE CONTRACTOR SHALL REMOVE ALL TRAFFIC CONTROL DEVICES NO LONGER NEEDED TO PERMIT FREE AND SAFE PASSAGE OF PUBLIC TRAFFIC.

   C. PROVIDE ADEQUATE, SAFE, NONSKID BRIDGING MATERIAL OVER TRENCHES IN PAVEMENT AREAS TO HANDLE HS20-44 VEHICULAR TRAFFIC. SECURE BRIDGING MATERIAL FROM LATERAL MOVEMENT AND VERTICAL VIBRATION TO MINIMIZE NOISE WHILE IN USE.

   D. SHAFTER FLATS TRACK TO REMAIN OPEN DURING CONSTRUCTION. SAFE PEDESTRIAN TRAFFIC SHALL BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.

   E. POSTED SPEED LIMIT IN PROJECT AREA IS 15 MPH.

   F. ONE LANE ROAD (W20-4) AND FLAGGER AHEAD (W20-4) SIGN SHALL BE REMOVED OR COVERED WHEN NO WORK IS BEING PERFORMED AND LANE IS NOT CLOSED.

   G. MINIMUM TRAVEL LANE WIDTH IN THE AREA IS 10'-0".

   H. MINIMUM SPACING OF CONES OR DELINEATORS ARE:

      - LANE CLOSURE = 10 FT. O.C.
      - TANGENT = 20 FT. O.C.
      - TAPER = 20 FT. O.C.

   I. WHERE AN ACCESSIBLE ROUTE IS CLOSED OR BLOCKED DURING CONSTRUCTION, CONTRACTOR SHALL PROVIDE A TEMPORARY PEDESTRIAN ROUTE.

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FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

TRAFFIC CONTROL NOTES AND DETAIL

SHEET ID

CT001

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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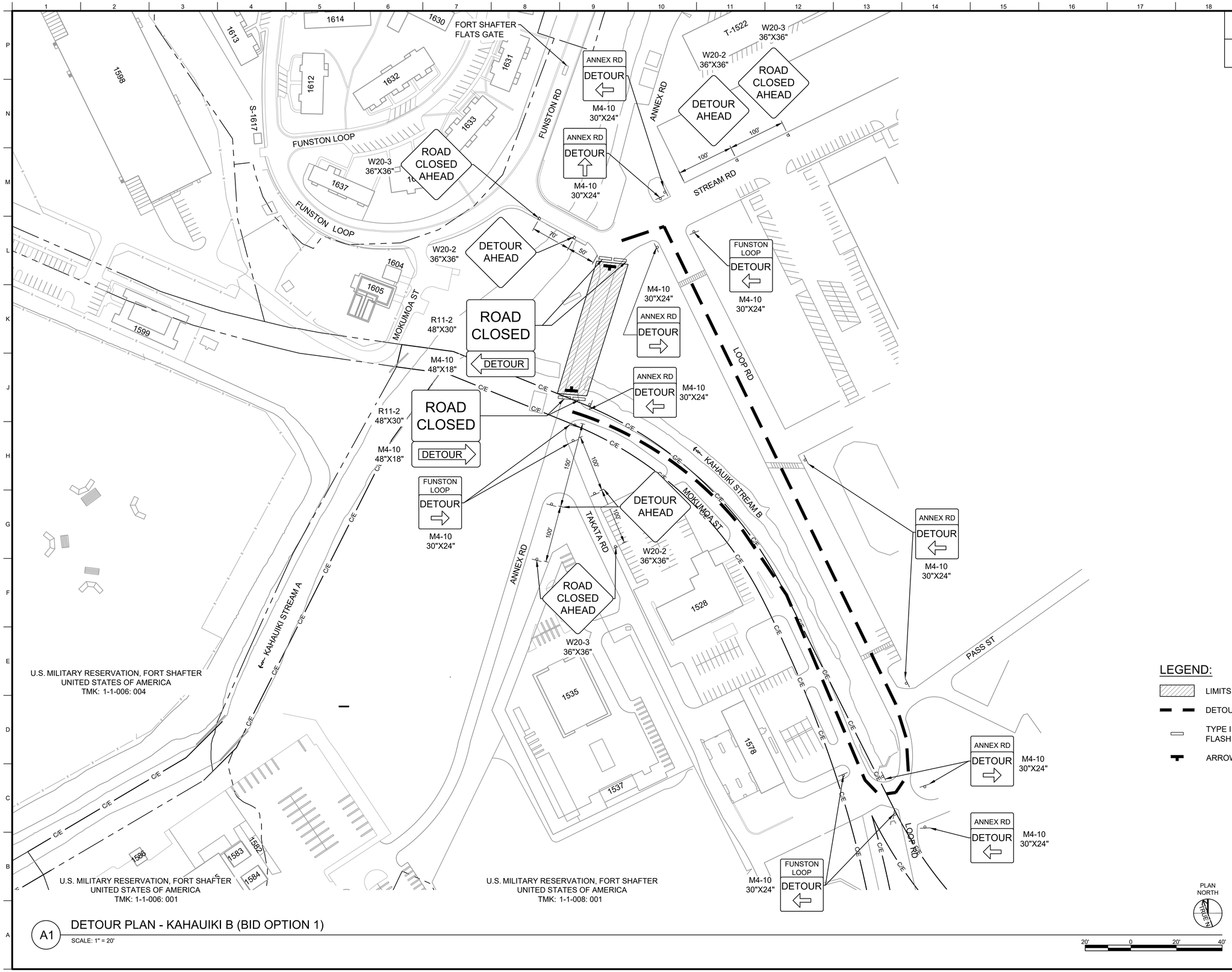

WORK HOURS

24-HOUR CONTINUOUS

A1 DETOUR PLAN - KAHAUIKI B (BID OPTION 1)

SCALE: 1" = 20'

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ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

DETOUR PLAN - KAHAUIKI B (BID OPTION 1)

SHEET ID

CT101

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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TREE PROTECTION/PRESERVATION NOTES:

1. THE GENERAL CONTRACTOR SHALL RETAIN THE SERVICES OF A QUALIFIED CERTIFIED ARBORIST WHO HAS BEEN CERTIFIED FOR AT LEAST 5 YEARS, WITH EXPERIENCE IN TREE PROTECTION AND PRESERVATION PLANNING DURING CONSTRUCTION, TREE AND ROOT PRUNING, AND TRANSPLANTING OF TREES. THE CONTRACTING OFFICE SHALL APPROVE THE SELECTION OF THE CERTIFIED ARBORIST. THE ARBORIST SHALL PROVIDE CONSULTING SERVICES AND PERFORM QUALITY ASSURANCE DUTIES DURING THE PRE-CONTRACT AND CONTRACT PERIOD OF WORK. THE ARBORIST SHALL ALSO ENSURE THAT BRANCH AND/OR ROOT PRUNING IS PERFORMED IN ACCORDANCE WITH ANSI A-300 PART 1 (2017). STANDARDS AS APPROVED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE AND THE TREE CARE INDUSTRY ASSOCIATION. HE OR SHE WILL FURTHER ENSURE THAT PROPER MEASURES ARE TAKEN TO PROTECT THE CROWN AND ROOT SYSTEMS OF THE TREES FROM UNNECESSARY DAMAGE FROM CONSTRUCTION ACTIVITY. WHEN POTENTIALLY DAMAGING CONSTRUCTION ACTIVITIES ARISE, I.E. MAJOR SUPPORT ROOT REMOVAL, EXCESSIVE ROOT REMOVAL ON ONE OR MORE SIDES OF THE TREE, MAJOR CROWN BRANCH REMOVAL, OR TREE TRANSPLANTING, THE ARBORIST WILL ENSURE THAT ALL SUCH ACTIVITY IS PERFORMED IN A MANNER THAT WILL MINIMIZE DAMAGE TO THE TREE. HE OR SHE WILL ENSURE THAT THE TREES ARE PROVIDED PROPER CARE AND RETAIN GOOD HEALTH DURING THE DEMOLITION AND CONSTRUCTION PERIOD AS HE OR SHE MAY DETERMINE. ALTERNATIVE PROCEDURES MAY BE REQUIRED ON A TREE-BY-TREE BASIS AND FIELD DECISIONS BY THE ARBORIST, CONTRACTOR, AND CONTRACTING OFFICER MAY BE REQUIRED TO ENSURE THE SAFETY AND HEALTH OF THE TREES, FOR EXAMPLE, RELOCATING OF DRIVEWAYS, UTILITIES, CURBS OR TREES. THIS PERSON WILL BE DESIGNATED AS THE CONTRACTOR'S PROJECT ARBORIST. THE PROJECT ARBORIST SHALL DIRECT, ASSIST AND MONITOR THE CONTRACTORS QUALIFIED TREE CARE AND/OR LANDSCAPE SUBCONTRACTOR'S CERTIFIED ARBORIST DURING IMPLEMENTATION OF THE TPPP.

2. THE CONTRACTOR SHALL ARRANGE A PRE-CONSTRUCTION MEETING WHICH SHALL BE ATTENDED BY THE CONTRACTOR, SUB-CONTRACTORS, THE CONTRACTING OFFICER, SELECTED CONSULTANTS, AND THE CONTRACTOR'S PROJECT ARBORIST TO REVIEW PROCEDURES FOR PERFORMING TREE-RELATED WORK, WORK IN THE AREAS AROUND THE TREES, ACCESS ROUTES AND STORAGE AREAS, AND WHAT MEASURES MAY NEED TO BE TAKEN TO PROTECT TREES DURING THE CONSTRUCTION PERIOD.

3. THE "TREE PROTECTION ZONE" (TPZ) AND/OR BARRIER: THE PROJECT ARBORIST, SHALL DETERMINE THE APPROPRIATE TPZ AFTER CONSULTING WITH THE CONTRACTOR AND CONTRACTING OFFICER CONCERNS. NO GRADING, COMPACTING, OR CONSTRUCTION ACTIVITY SHALL OCCUR IN THE ZONES IMMEDIATELY SURROUNDING THE TREE AND INSIDE THE BARRICADED AREA. WITHOUT APPROVAL FROM THE PROJECT ARBORIST ALL UNDERGROUND UTILITIES, STORM DRAINS, AND IRRIGATION LINES SHALL BE ROUTED OUTSIDE THE TREE PROTECTION ZONE. IF UTILITIES MUST TRAVERSE THE TREE PROTECTION ZONE, THEY SHALL BE TUNNELED, BORED AT A DEPTH OF 3 FEET, OR GREATER WITHIN THE ZONE. WHERE FEASIBLE, THE ZONE SHALL BE ENTIRELY ENCLOSED BY A TEMPORARY BARRIER PRIOR TO ANY DEMOLITION WORK AND SHALL REMAIN IN PLACE UNTIL ALL SITE WORK IS COMPLETED. THE PROTECTION BARRIERS SHALL NOT BE RELOCATED OR REMOVED WITHOUT THE PERMISSION OF THE PROJECT ARBORIST.

4. LIMITATION OF CONSTRUCTION ACTIVITIES UNDER THE TREE CROWN: THE CONTRACTOR SHALL LIMIT ACTIVITIES UNDER THE CROWN OF TREES TO ONLY THOSE ACTIVITIES EXPLICITLY REQUIRED TO COMPLETE THE CONSTRUCTION UNDER AND/OR ADJACENT TO THE TREE'S CROWN AS SPECIFIED. ALL EXCAVATION WORK REQUIRED UNDER THE CROWN OF THE TREES SHALL BE PERFORMED UNDER THE DIRECTION OF THE PROJECT ARBORIST. MATERIAL AND TOPSOIL STOCKPILING, VEHICLE PARKING, TEMPORARY ROADWAYS, CONSTRUCTION MATERIAL MIXING, PORTABLE LATRINES AND FIELD OFFICES WILL NOT BE LOCATED EITHER TEMPORARILY OR PERMANENTLY UNDER THE TREE CROWNS UNLESS AREAS HAVE PRE-EXISTED PAVING AND/OR HAVE BEEN SPECIFICALLY APPROVED BY THE PROJECT ARBORIST.

5. TREE CROWN AND ROOT PRUNING: A CERTIFIED ARBORIST OR CERTIFIED TREE WORKER UNDER THE GENERAL SUPERVISION OF THE CONTRACTOR'S PROJECT ARBORIST SHALL PERFORM THE TREE PRUNING AND ROOT PRUNING WORK BASED ON ANSI A300 PRUNING PART 1, (2017).

6. ROOT PRUNING: BEFORE GRADING, PREPARATION OF ROADBED, CURBING AND SIDEWALK, EXCAVATION FOR FOUNDATIONS, FOOTINGS, WALLS OR TRENCHING, SURFACE, ROOTS THAT ARE GREATER THAN 2 INCHES IN DIAMETER MUST BE PRUNED BY MANUALLY DIGGING A TRENCH AND CUTTING EXPOSED SURFACE ROOTS WITH A POWER OR HAND SAW, ROCK SAW, OR NARROW TRENCHER WITH A SHARP BLADE, OR APPROVED ROOT PRUNING EQUIPMENT. ROOT PRUNING OF ROOTS BELOW THE SURFACE WILL BE DONE BY CAREFULLY EXPOSING THEM BY HAND OR POWER EQUIPMENT UNDER THE SUPERVISION OF THE ARBORIST. ANY ROOTS DAMAGED DURING GRADING OR CONSTRUCTION SHALL BE EXPOSED TO THE NEAREST SOUND TISSUE AND CUT CLEANLY WITH A SHARP SAW UNDER THE PROJECT ARBORIST'S APPROVAL. PROJECT ARBORIST SHALL DETERMINE WHETHER CROWN PRUNING IS REQUIRED AFTER ASSESSING TREE STRUCTURE, QUALITY, AND SIZE OF ROOTS PRUNED.

TREE PROTECTION/PRESERVATION NOTES (CONT.):

7. TREE CROWN PRUNING: THE PROJECT ARBORIST SHALL DIRECT THE CERTIFIED ARBORIST AND/OR CERTIFIED TREE WORKER WITH THE RECOMMENDED PRUNING PROCEDURES (I.E. CROWN CLEAN, CROWN RAISE, CROWN REDUCTION, CROWN THINNING, USING ANSI A300 PRUNING GUIDELINES PART 1 (2017).

8. MANAGEMENT AND DISPOSAL OF GREEN WASTE GENERATED DURING CONSTRUCTION ACTIVITIES SUCH AS VEGETATION CLEARING, SHALL COMPLY WITH USAG-HI GREEN WASTE POLICY MEMORANDUM DATED DECEMBER 19, 2022. GREEN WASTE INCLUDES ANY PLANT MATERIAL THAT HAS BEEN TRIMMED, CUT, UPROOTED, OR FALLEN SUCH AS LOGS, STUMPS, BRANCHES, LEAVE, PALM FRONDS, PLANTS, GRASS CLIPPINGS, AND TRIMMINGS. https://home.army.mil/hawaii/application/files/2316/7579/9038/USAG-HI-50_GREEN_WASTE_POL.2022.pdf

9. ORGANIC MULCH: THE PROJECT ARBORIST SHALL DETERMINE WHEN MULCH IS REQUIRED INSIDE THE TREE PROTECTION ZONE. MULCH SHALL BE INSTALLED INSIDE THE TREE PROTECTION ZONE 1-1/2 INCHES THICK MAXIMUM TO MINIMIZE BREEDING GROUNDS FOR COCONUT RHINOCEROS BEETLE (CRB). AFTER CONSTRUCTION AND REMOVAL OF THE TREE PROTECTION FENCING, SPREAD MULCH THIN TO 1" DEPTH OR LESS. THERE SHALL BE A GAP OF TWO INCHES BETWEEN THE TRUNK AND MULCH LAYER.

10. TREE MAINTENANCE: IN CONSULTATION WITH THE PROJECT ARBORIST, THE CONTRACTOR ARBORIST SHALL IRRIGATE THE TREES AS NECESSARY TO MAINTAIN THEIR HEALTH DURING THE COURSE OF THE DEMOLITION AND CONSTRUCTION PERIOD. GROUNDCOVER IS TO BE MAINTAINED. NO HERBICIDES ARE PERMITTED UNDER THE TREE CROWNS WITHOUT PRIOR APPROVAL.

11. IF TREE OR ROOT INJURY SHOULD OCCUR: IF DAMAGE SHOULD OCCUR DURING DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY SUCH INJURY TO THE PROJECT ARBORIST. THE PROJECT ARBORIST AND CONTRACTORS CERTIFIED ARBORIST SHALL EVALUATE THE INJURY AND APPLY THE APPROPRIATE TREATMENT. THE CONTRACTORS PROJECT ARBORIST SHALL SUBMIT A WRITTEN REPORT OF THE TREE INJURY AND TREATMENT TO THE CONTRACTING OFFICER.

12. PENALTIES, COMPENSATION AND MITIGATION: PARTIAL INJURY OR TOTAL TREE LOSS: A SUB-CONTRACTOR SHALL PAY TO THE TREE OWNER THE VALUE OF ANY EXISTING TREES TO REMAIN ON SITE, PROVIDED THAT SUCH TREE DIED, SUSTAINED DAMAGE, AND/OR REQUIRED CARE OR REMOVAL DUE TO FAILURE OF THE SUB-CONTRACTOR TO PROVIDE ADEQUATE PROTECTION, MAINTENANCE OR FULL COMPLIANCE WITH THE TREE PROTECTION AND PRESERVATION PLAN SPECIFICATIONS. REPLACEMENT WILL BE WITH A COMPARABLE TREE ACCEPTABLE TO THE PROJECT ARBORIST AND THE LANDSCAPE ARCHITECT.

    IF APPROPRIATE MEASURES HAVE BEEN TAKEN TO MINIMIZE THE DAMAGE, AND NO SIGNIFICANT TREE DECLINE, LOSS OF FUNCTION, OR DEATH OCCURS, PENALTIES AND/OR COMPENSATION MAY BE WAIVED PER APPROVAL OF THE PROJECT ARBORIST AND CONTRACTING OFFICER.

    THE VALUE OF THE TREE SHALL BE DETERMINED BY THE ARBORIST BASED ON THE METHODS OF TREE APPRAISAL SET FORTH IN GUIDE FOR PLANT APPRAISAL (9TH EDITION). ANY WOUND OR INFLICTION TO TREES REMAINING ON SITE CONSTITUTES A PARTIAL INJURY VIOLATION.

    PARTIAL INJURY INCLUDES BUT IS NOT LIMITED TO:

    A. MECHANICAL INJURIES AS BREAKS, RIPS, PUNCTURES, HOLES, SPLITS, CRACKS, TEARS AND OTHER WOUND TO TREE TRUNK, BRANCHES OR ROOTS CAUSED BY PERSONS, TOOLS, VEHICLES, EQUIPMENT OR OTHER LARGE OBJECTS ASSOCIATED WITH CONSTRUCTION ACTIVITY.

    B. CRUSHED ROOTS CAUSED BY PERSONS OR EQUIPMENT

    C. COMPACTED SOIL CAUSED BY VEHICLES OR HEAVY EQUIPMENT

    D. CHEMICAL CONTAMINATION BY PERSONS OR EQUIPMENT ON CONSTRUCTION SITE

    E. UNAPPROVED GRADE LEVEL CHANGES

    F. IMPROPER PRUNING PROCEDURES

13. PER USAG-HI TREE CUTTING MORATORIUM DATED 10 MARCH 2023 AND TO COMPLY WITH THE ENDANGERED SPECIES ACT, THE FOLLOWING MEASURES SHALL BE IMPLEMENTED:

    A. DURING THE HAWAIIAN HOARY BAT (LASIURUS CINEREUS SEMOTUS) PUPPING SEASON, 1 JUNE TO 15 SEPTEMBER, THERE SHALL BE NO CUTTING OR TRIMMING OF ANY TREE OVER 15 FEET TALL.

    B. IF A TREE FALLS ON ITS OWN THAT IS OVER 15 FEET TALL, THE TREE MAY BE REMOVED.

    C. IN CASE OF AN EMERGENCY SITUATION, E.G. A TREE LARGER THAN 15 FEET TALL IS THREATENING A POWER LINE, THE STAFF MUST CONTACT THE DPW ENVIRONMENTAL DIVISION AT (808)655-9189 FOR GUIDANCE PRIOR TO CUTTING THE TREE.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: I. HIGASHI | ISSUE DATE: TBD
DRAWN BY: V. FORCELLA | SOLICITATION NO.: TBD
CHECKED BY: I. HIGASHI | CONTRACT NO.: TBD
SUBMITTED BY: M. FUJIOKA | SIZE: ANSI D | RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

LANDSCAPE NOTES AND DETAILS

SHEET ID
L-001

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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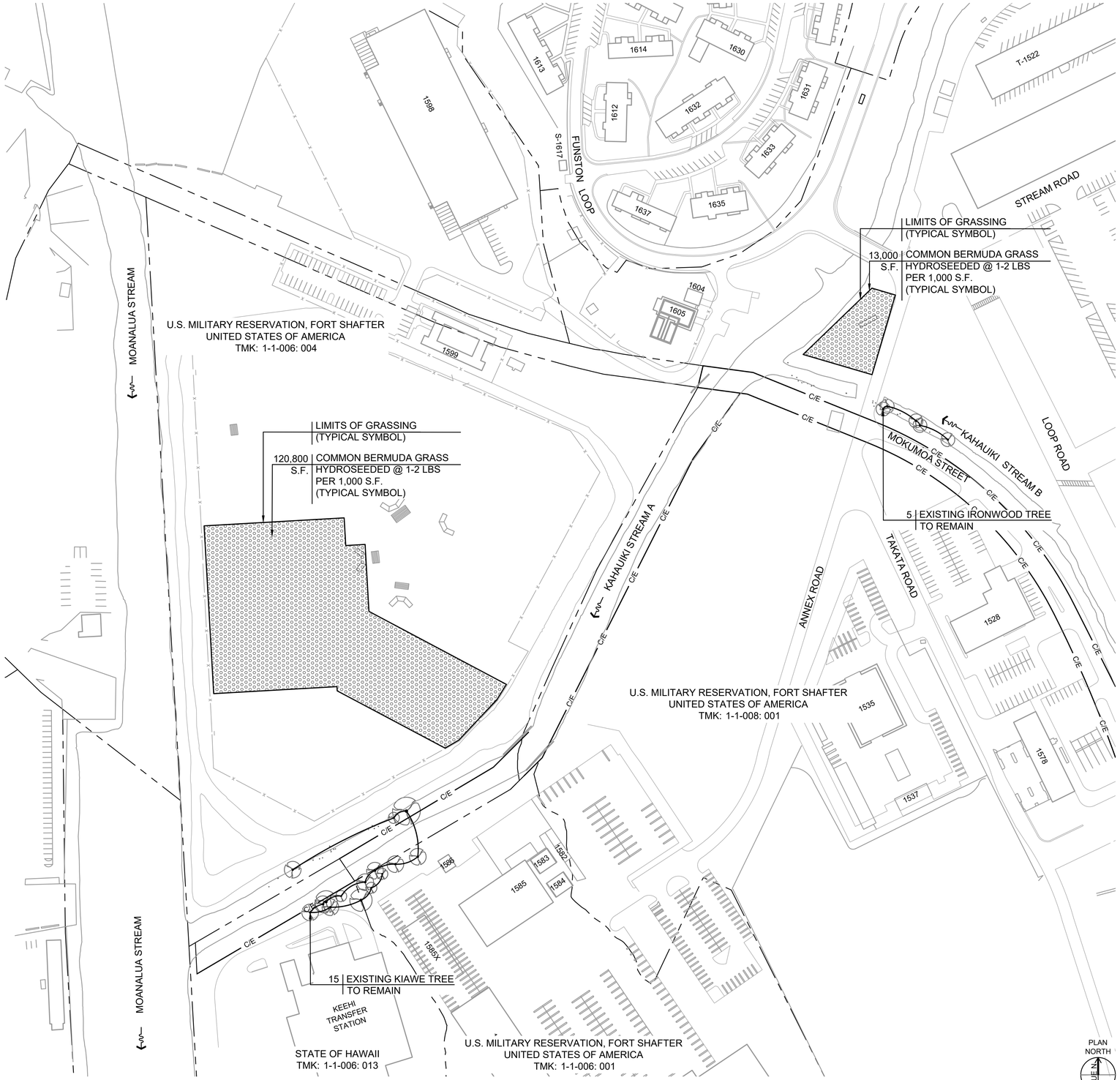

A1 LANDSCAPE RESTORATION PLAN

SCALE: 1" = 100'

100' 0 100' 200'

PLANT LIST

TREES	SIZE AND CONDITIONS	QUANTITY
KIAWE TREES (EXISTING TO REMAIN)	20' TO 50' HEIGHT	15
IRONWOOD TREES (EXISTING TO REMAIN)	35' HEIGHT	5

GRASS	SIZE AND CONDITIONS	QUANTITY
COMMON BERMUDA GRASS	S.F.; HYDROSEEDED @ 1-2 LBS/1,000 SF	133,800

MISCELLANEOUS	SIZE AND CONDITIONS	QUANTITY
IMPORTED SCREENED TOPSOIL W/AMENDMENTS	C.Y., 2" LAYER	826
TEMPORARY IRRIGATION SYSTEM	S.F.	133,800
MAINTENANCE PERIOD	90 CALENDAR DAYS OR 95% COVERAGE	–

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD

DESIGNED BY: I. HIGASHI
DRAWN BY: V. FORCELLA
CHECKED BY: I. HIGASHI
SUBMITTED BY: M. FUJIOKA
SIZE: ANSI D

RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

LANDSCAPE RESTORATION PLAN

SHEET ID
LS101

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

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STRUCTURAL GENERAL NOTES:

I. DESIGN REFERENCES

1. UFC 3-301-01 STRUCTURAL DESIGN CRITERIA FOR STRUCTURES OTHER THAN BUILDINGS
2. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020
3. INTERNATIONAL BUILDING CODE (IBC), 2021
4. ACI 318-19 CODE REQUIREMENTS FOR BUILDING STRUCTURES

II. DESIGN LOADS

1. LIVE LOAD SURCHARGE EQUIVALENT SOIL HEIGHT------- 2.0 FT
2. SOIL PROPERTIES
   A. ACTIVE (ABOVE GROUNDWATER)----------40 PCF
   B. ACTIVE (BELOW GROUNDWATER)----------19 PCF
   C. SEISMIC DYNAMIC----------14H² LBS/FT
   D. COEFFICIENT OF LATERAL EARTH PRESSURE--------- 0.33
   E. SOIL WEIGHT---------- 110 PCF
   F. SUBMERGED PASSIVE ----------100 PCF
3. LIQUID (WATER)----------62.4 PCF
4. HELICAL PILE ULTIMATE CAPACITIES
   A. COMPRESSIVE ---------- 30 KIPS
   B. UPLIFT ---------- 3.0 KIPS
   B. LATERAL ---------- 3.0 KIPS

III. FOUNDATION

1. CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATION FROM SURFACE WATER, GROUND WATER OR SEEPAGE.
2. EXCAVATIONS FOR ANY PURPOSE SHALL NOT REMOVE LATERAL SUPPORT FROM ANY FOOTING OR FOUNDATION WITHOUT FIRST UNDERPINNING OR PROTECTING THE FOOTING OR FOUNDATION AGAINST SETTLEMENT OR LATERAL TRANSLATION.
3. FOOTINGS SHALL BEAR ON A SOUND AND LEVEL SOIL SURFACE. EXISTING SOIL AT BOTTOM OF FOOTINGS SHALL BE COMPACTED TO PROVIDE A RELATIVELY FIRM AND SMOOTH BEARING SURFACE PRIOR TO PLACEMENT OF REINFORCING STEEL AND CONCRETE.
4. EXCAVATIONS FOR FOUNDATIONS SHALL BE MONITORED AND APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF CONCRETE AND REINFORCING STEEL.
5. CONTRACTOR SHALL BRACE OR PROTECT ALL WALLS BELOW GRADE FROM LATERAL LOADS UNTIL THEY HAVE ATTAINED THEIR FULL DESIGN STRENGTH.
6. JOINTS IN WALLS AND FLOOR, JOINTS BETWEEN THE WALL AND FLOOR AND PENETRATIONS IN THE WALL AND FLOOR SHALL BE MADE WATERTIGHT UTILIZING APPROVED METHODS AND MATERIALS.
7. FOR FILL MATERIALS SURROUNDING NEW PIPES, REFER TO THE SPECIFICATIONS AND CIVIL PLANS. ALL OTHER FILL MATERIAL TO BE GENERAL FILL OR IMPORTED FILL, AS DESCRIBED BELOW.
8. GENERAL FILLS MAY CONSIST OF THE ON-SITE SOILS WITH THE MAXIMUM PARTICLE SIZE OF 3 INCHES OR LESS AND SHALL BE FREE OF DELETERIOUS MATERIALS. IN GENERAL, THE EXCAVATED ON-SITE MATERIALS MAY BE REUSED AS A SOURCE OF GENERAL FILL MATERIAL, PROVIDED THEY ARE FREE OF VEGETATION, DEBRIS, DELETERIOUS MATERIALS, AND OTHER UNSUITABLE MATERIALS. IMPORTED FILL MATERIALS, IF REQUIRED, SHALL CONSIST OF NON-EXPANSIVE STRUCTURAL FILL MATERIAL. THE FILL SHALL BE WELL- GRADED WITH PARTICLES NO LARGER THAN 3 INCHES. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR IMPORTED FILL. GENERAL FILL MATERIALS SHALL BE PLACED IN LEVEL LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS, MOISTURE-CONDITIONED TO ABOUT 2 TO 4 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO AT LEAST 90 PERCENT RELATIVE COMPACTION.
9. FOR HELICAL PILE PROVISIONS, SEE SPECIFICATIONS SECTION 31 63 26.60. GEOTECHNICAL ENGINEER OBSERVATION, APPROVAL, AND SPECIAL INSPECTION REQUIRED.

IV. CONCRETE NOTES:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318.
2. CONCRETE SHALL BE NORMAL WEIGHT HARD ROCK CONCRETE AND SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH 4,000 PSI.
3. CONCRETE DELIVERY TICKETS SHALL RECORD ALL FREE WATER IN THE MIX AT BATCHING BY PLANT, FOR CONSISTENCY BY DRIVER, AND ANY ADDITIONAL REQUEST BY CONTRACTOR IF PERMITTED BY THE MIX DESIGN.
4. WATER USED IN MIXING CONCRETE SHALL BE CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OILS, ACIDS, ALKALIS, SALTS, ORGANIC MATERIALS OR OTHER SUBSTANCES THAT ARE DELETERIOUS TO CONCRETE OR STEEL REINFORCEMENT.
5. ALL INSERTS, ANCHOR BOLTS, PLATES, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153 UNLESS OTHERWISE NOTED.
6. REINFORCING BARS, ANCHOR BOLTS, INSERTS, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.
7. ALL EXPOSED EDGES HALL HAVE A CONTINUOUS ¾" CHAMFER, UNLESS NOTED OTHERWISE.

V. REINFORCING STEEL:

1. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60.
2. CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
   F. FOOTING, CONCRETE JACKET, ETC. CAST AGAINST EARTH: -------- 3"
   G. FOOTING, CONCRETE JACKET, ETC. FORMED AND EXPOSED TO EARTH OR WEATHER: ---------- 2"
3. ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS, AND OTHER INSERTS AND EMBEDS SHALL BE SECURED IN POSITION, INSPECTED AND APPROVED PRIOR TO PLACING CONCRETE.
4. REINFORCING BARS SHALL NOT BE IN CONTACT WITH ANY PIPE, PIPE FLANGE OR METAL PARTS EMBEDDED IN CONCRETE, A MINIMUM OF 2 INCH CLEARANCE SHALL BE PROVIDED AT ALL TIMES, UNO.

VI. SPECIAL INSPECTION

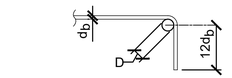
1. SPECIAL INSPECTIONS ARE REQUIRED FOR THIS PROJECT AND SHALL BE PERFORMED IN ACCORDANCE WITH IBC CHAPTER 17. SPECIAL INSPECTIONS SHALL BE ARRANGED AND PAID FOR BY THE CONTRACTOR AND PERFORMED BY AN INSPECTOR QUALIFIED FOR SPECIAL INSPECTION IN THE CATEGORIES SPECIFIED:
   CONCRETE PLACEMENT - CONCRETE ANCHORS - REINFORCING STEEL PLACEMENT - GRADING, EXCAVATION - HELICAL PILE INSTALLATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SPECIAL INSPECTION AT NO ADDITIONAL COST TO THE GOVERNMENT, AND BE RESPONSIBLE TO CORRECT DEFECTIVE WORK AND RE-INSPECTION AT NO COST TO THE OWNER.

MINIMUM SPLICE AND DEVELOPMENT LENGTHS					
BAR SIZE	CONCRETE STRENGTH = 4,000 PSI				
	LAP SPLICE		DEVELOPMENT		
			STRAIGHT		WITH STANDARD HOOK
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	
#3	26"	20"	20"	16"	8"
#4	34"	26"	26"	20"	10"
#5	42"	32"	32"	24"	12"
#6	50"	38"	38"	30"	16"
#7	72"	54"	54"	42"	18"
#8	82"	62"	62"	48"	20"
#9	92"	70"	70"	54"	22"
#10	102"	80"	80"	62"	26"
#11	114"	88"	88"	68"	28"

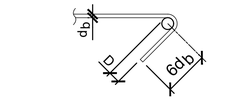
NOTES:
1. LENGTHS ARE FOR CONCRETE WITH REBAR SPACED AT 6 BAR DIAMETERS MINIMUM. INCREASE LENGTHS BY 25% FOR BARS SPACED LESS THAN 6 BAR DIAMETERS.
2. "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.

K13 TYPICAL REBAR SPLICE AND DEVELOPMENT LENGTH SCHEDULE

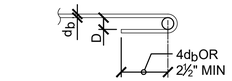
SCALE: NTS



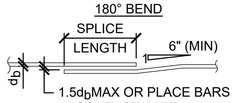
90° BEND



135° BEND



180° BEND



BAR LAP

D = $6d_b$ FOR #8 AND SMALLER
D = $8d_b$ FOR #9 TO #11

ABBREVIATION LEGEND

ACI	- AMERICAN CONCRETE INSTITUTE	KSI	- KIP PER SQUARE INCH
ANSI	- AMERICAN NATIONAL STANDARD INSTITUTE	LBS	- POUNDS
ASTM	- AMERICAN SOCIETY FOR TESTING AND MATERIALS	LP	- LOW POINT
		MANUF.	- MANUFACTURER
AWS	- AMERICAN WELDING SOCIETY	MAX	- MAXIMUM
AWWA	- AMERICAN WATER WORKS ASSOCIATION	MIN	- MINIMUM
℄	- CENTERLINE	NO	- NUMBER
CLR	- CLEAR	NOM	- NOMINAL
CONC	- CONCRETE	OC	- ON CENTER
CONT	- CONTINUOUS	OD	- OUTSIDE DIAMETER
DI	- DUCTILE IRON	PCF	- POUNDS PER CUBIC FOOT
DIA/Ø	- DIAMETER	PSF	- POUNDS PER SQUARE FOOT
DIAG	- DIAGONAL	PSI	- POUNDS PER SQUARE INCH
DWGS	- DRAWINGS	RCP	- REINFORCED CONCRETE PIPE
EA	- EACH	REINF	- REINFORCEMENT
EF	- EACH FACE	SCH	- SCHEDULE
ELEV	- ELEVATION	SECT	- SECTION
ETC.	- ETCETERA	SIM	- SIMILAR
EW	- EACH WAY	SS/SST	- STAINLESS STEEL
FF	- FINISHED FLOOR	STD	- STANDARD
FG	- FINISHED GRADE	SYMM	- SYMMETRICAL
FT	- FOOT	TYP	- TYPICAL
FTG	- FOOTING	UFC	- UNIFIED FACILITIES CRITERIA
GA	- GAUGE	UNO	- UNLESS NOTED OTHERWISE
GALV	- GALVANIZED	VERT	- VERTICAL
HORIZ	- HORIZONTAL	W/	- WITH
IBC	- INTERNATIONAL BUILDING CODE	%	- PERCENT

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. SAIF
DRAWN BY: CAD
CHECKED BY: J. FUJITA
SUBMITTED BY: J. FUJITA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

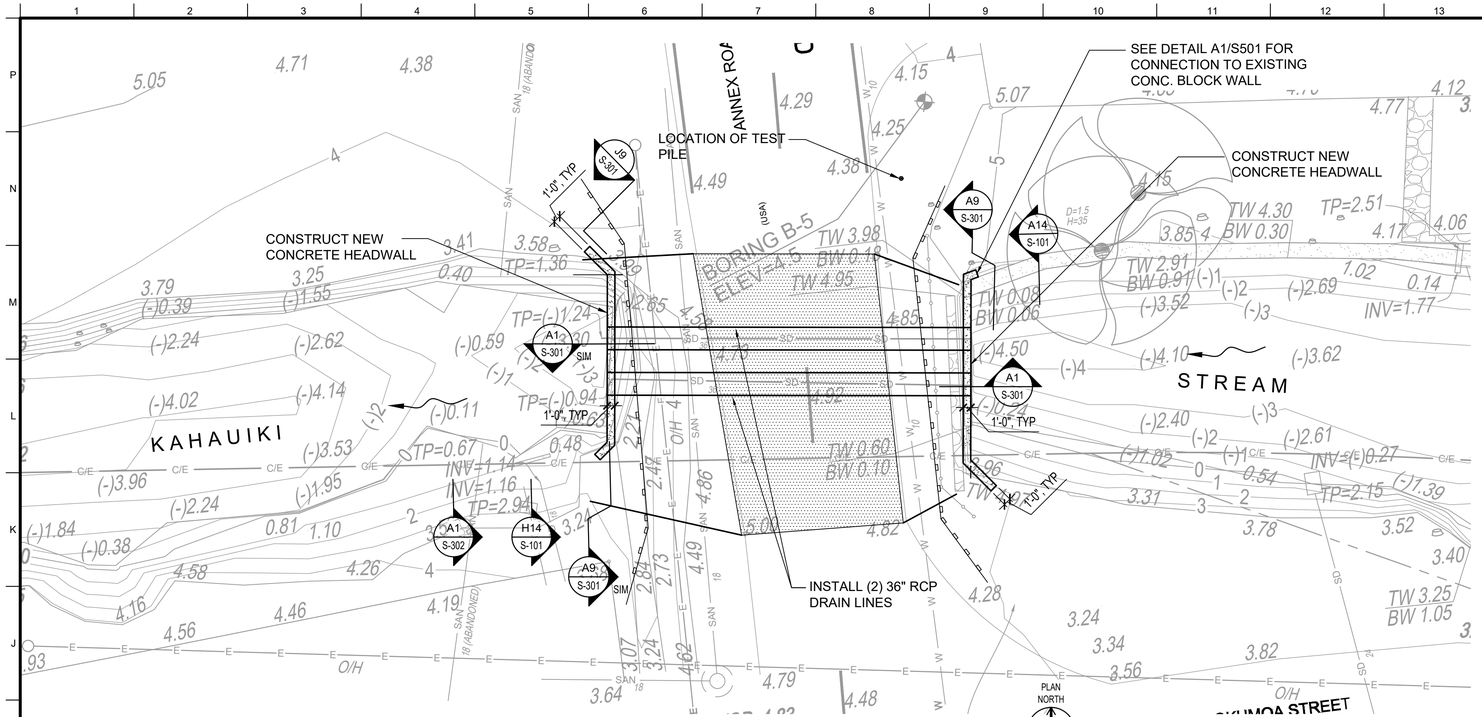
FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

BID OPTION 1: STRUCTURAL GENERAL NOTES

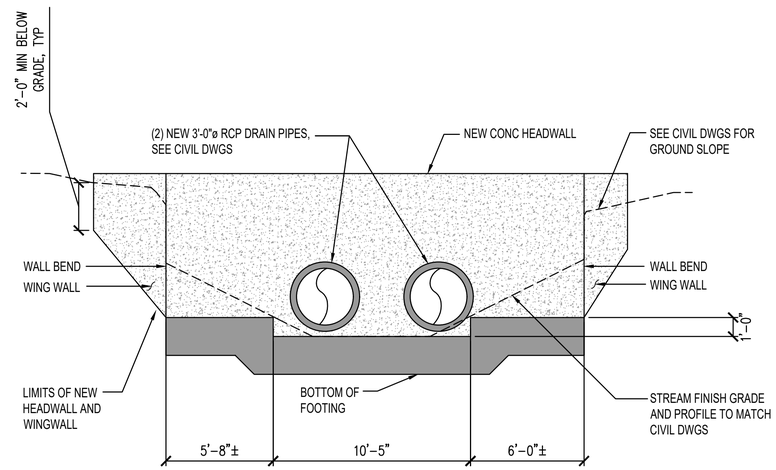
SHEET ID
S-001

FILE: P:\5801-585\05808.16 ACOE - Kahauiki Stream Maintenance Dredging, Phase 2 CLIN 2\050 Drawings\Structural\AutoCAD_format\2025-05-09_5808-16 Stream Dredging Headwall
USER: CSAIF
PLOTTED: 5/9/2025 11:00 AM

RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

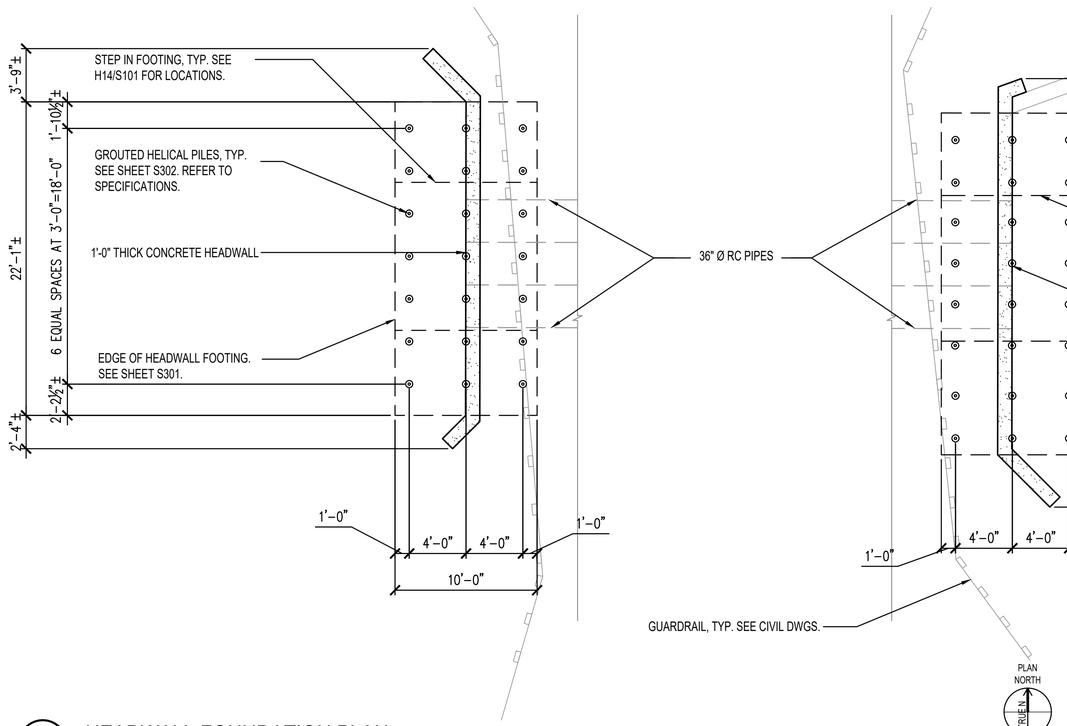


H1 BRIDGE LAYOUT PLAN (BID OPTION 1)
SCALE: 1" = 10'-0"

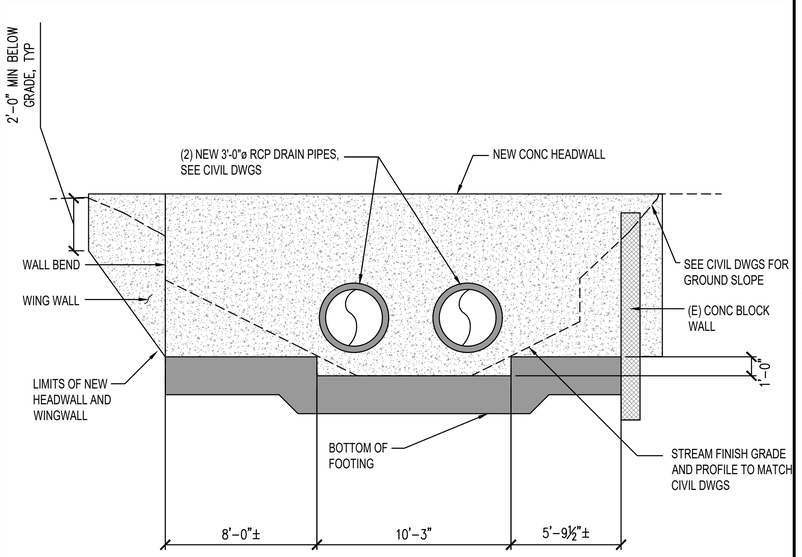


NOTES:
1. HELICAL PILES NOT SHOWN FOR CLARITY.
2. CONTRACTOR TO VERIFY NUMBER OF STEPS IN FOOTING.

H14 WEST HEADWALL ELEVATION (BID OPTION 1)
SCALE: NTS



A1 HEADWALL FOUNDATION PLAN
SCALE: 3/16" = 1'-0"



NOTES:
1. HELICAL PILES NOT SHOWN FOR CLARITY.
2. CONTRACTOR TO VERIFY EXISTING WALL CONDITIONS
2. CONTRACTOR TO VERIFY NUMBER OF STEPS IN FOOTING.

A14 EAST HEADWALL ELEVATION (BID OPTION 1)
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. SAIF	ISSUE DATE: TBD
DRAWN BY: CAD	SOLICITATION NO.: TBD
CHECKED BY: J. FUJITA	CONTRACT NO.: TBD
SUBMITTED BY: J. FUJITA	RTA SUBMITTAL
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

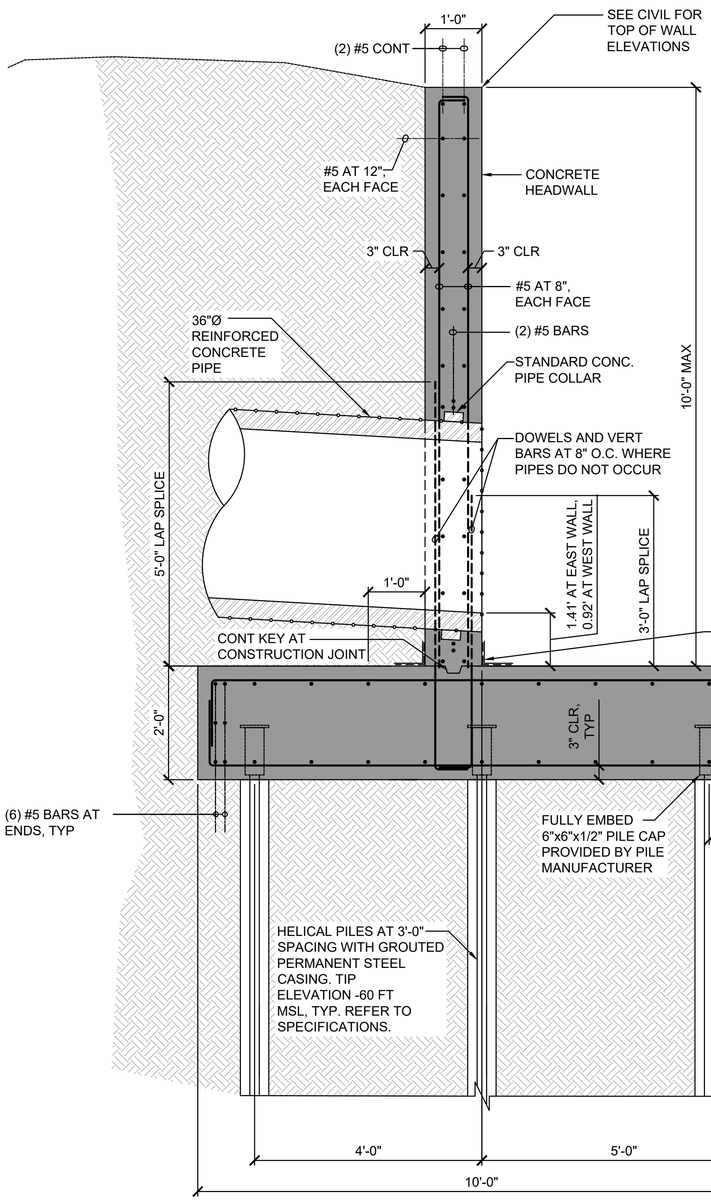
FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

BRIDGE LAYOUT PLAN

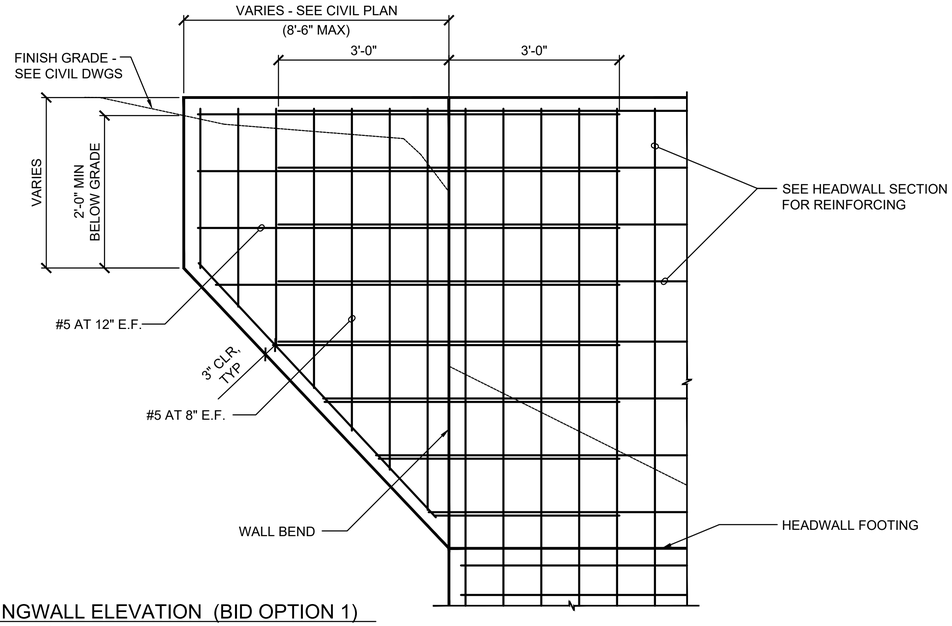
SHEET ID
S-101

FILE: P:\5801-585\05808.16 ACOE - Kahauiki Stream Maintenance Dredging, Phase 2 CLIN 2\050 Drawings\Structural\AutoCAD_format\2025-05-09_5808-16 Stream Dredging Headwall
USER: CSAIF
PLOTTED: 5/9/2025 11:00 AM

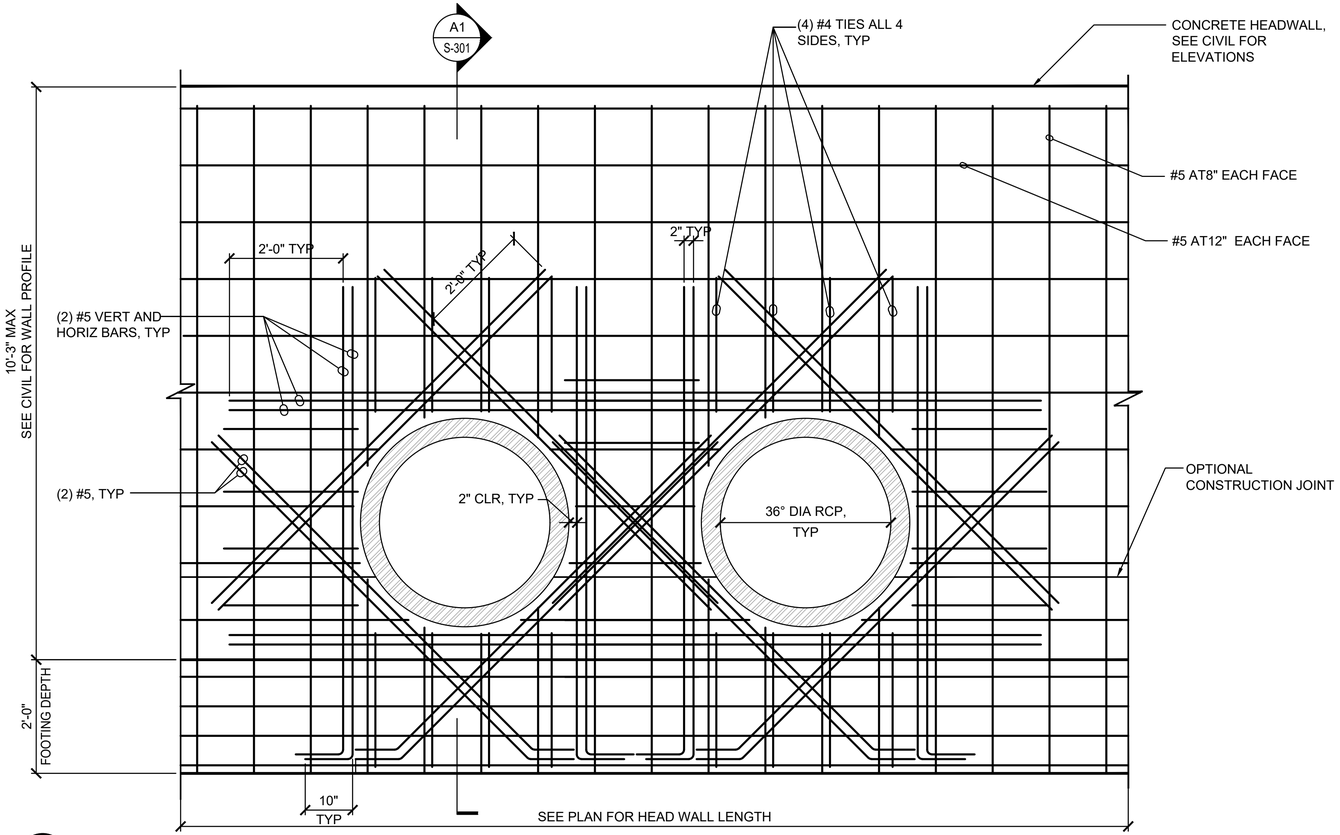
RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans



A1 HEADWALL SECTION (BID OPTION 1)
SCALE: NTS



J9 WINGWALL ELEVATION (BID OPTION 1)
SCALE: NTS



A9 HEADWALL ELEVATION (BID OPTION 1)
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. SAIF
DRAWN BY: CAD
CHECKED BY: J. FUJITA
SUBMITTED BY: J. FUJITA
SIZE: ANSI D
ISSUE DATE: TBD
RTA SUBMITTAL
SOLICITATION NO.: TBD
CONTRACT NO.: TBD

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

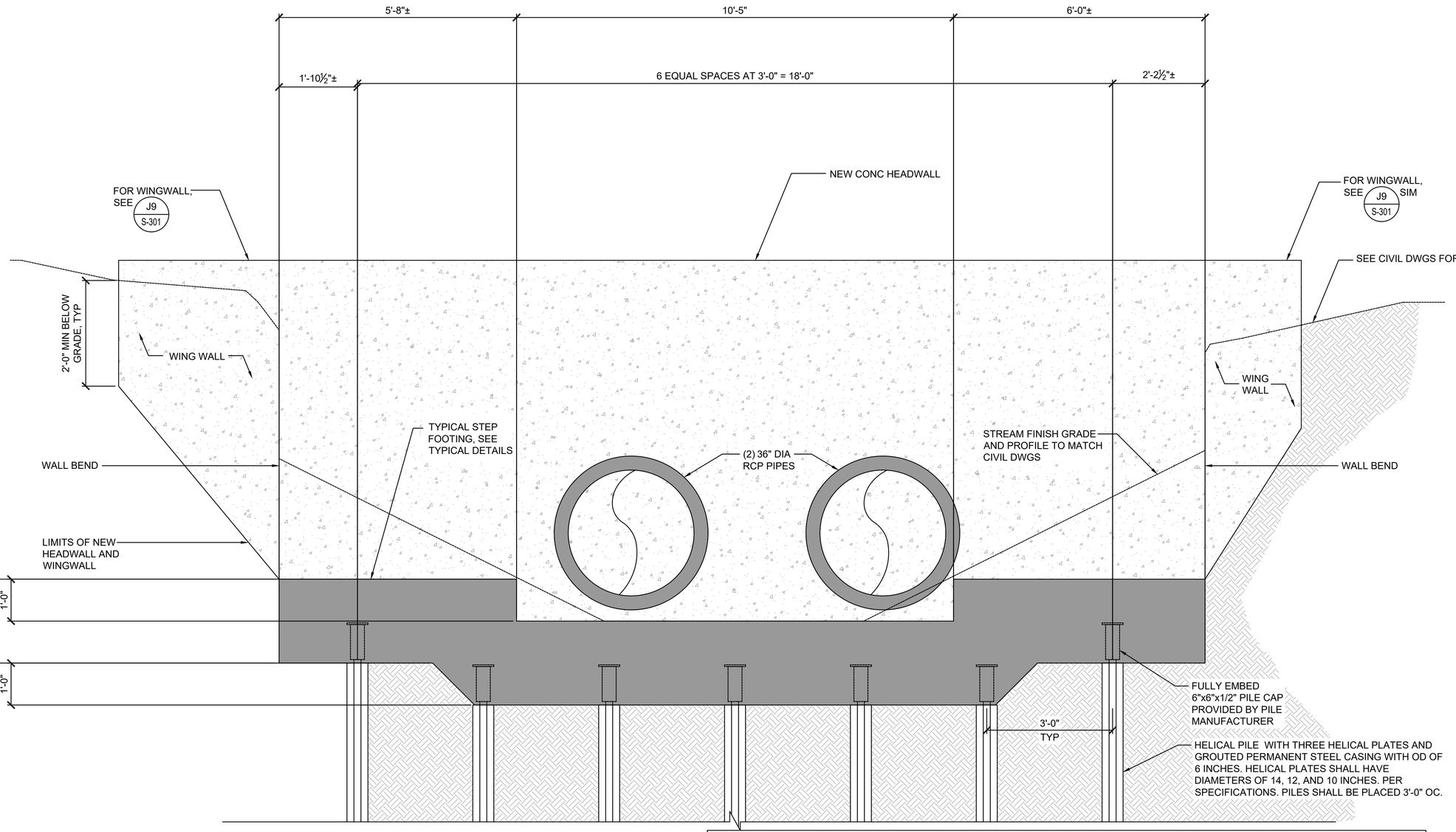
HEADWALL SECTIONS

SHEET ID
S-301

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: P:\5801-585\05808.16 ACOE - Kahauiki Stream Maintenance Dredging, Phase 2 CLIN 2\050 Drawings\Structural\AutoCAD_format\2025-05-09_5808-16 Stream Dredging Headwall
USER: CSAIF
PLOTTED: 5/9/2025 11:01 AM



HELICAL PILE NOTES:

1. HELICAL PILES WITH A GROUTED PERMANENT STEEL ENCASED LEAD SECTION SHALL CONFORM TO A MINIMUM 2.875" OUTSIDE DIAMETER SOLID HIGH STRENGTH STEEL SHAFT AND SEQUENTIAL HELICAL PLATES OF 14,12, AND 10 INCHES. LARGEST HELICAL PLATE SHALL BE NEAREST TO THE TOP OF SHAFT. GROUT COLUMN SHALL HAVE OD OF 6 INCHES MINIMUM. HELICAL PILE CAPACITY SHALL BE A MINIMUM OF 15 KIPS WITH A SAFETY FACTOR OF 2.
2. HELICAL PLATES SHALL BE PLACED AT 5'-0" SPACING WITH A 2'-0" LONG PILOT POINT. LEAD SECTION TOTAL LENGTH SHALL BE 15'-0".
3. SHAFT EXTENSION SHALL BE 45'-0" IN LENGTH.

A1 HEADWALL FOUNDATION ELEVATION (BID OPTION 1)
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. SAIF
DRAWN BY: CAD
CHECKED BY: J. FUJITA
SUBMITTED BY: J. FUJITA
SIZE: ANSI D
ISSUE DATE: TBD
SOLICITATION NO.: TBD
CONTRACT NO.: TBD
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

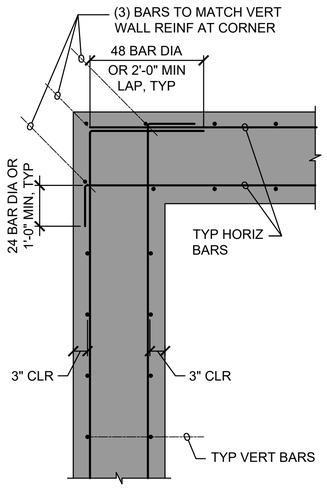
FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

HEADWALL FOUNDATION ELEVATION

SHEET ID
S-302

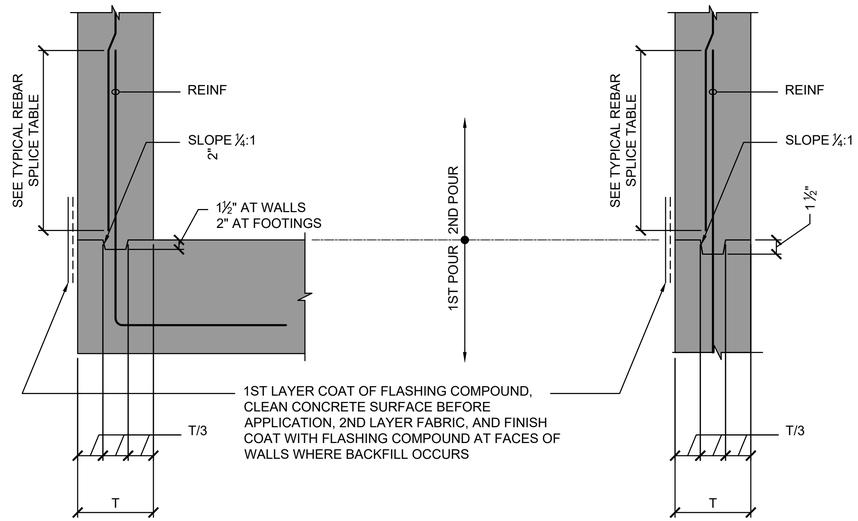
RTA SUBMITTAL Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: P:\5801-585\5808.16 ACOE - Kahauiki Stream Maintenance Dredging, Phase 2 CLIN 2\050 Drawings\Structural\AutoCAD_format\2025-05-09_5808-16 Stream Dredging Headwall
USER: CSAIF
PLOTTED: 5/9/2025 11:01 AM



AT 12" THICK WALLS

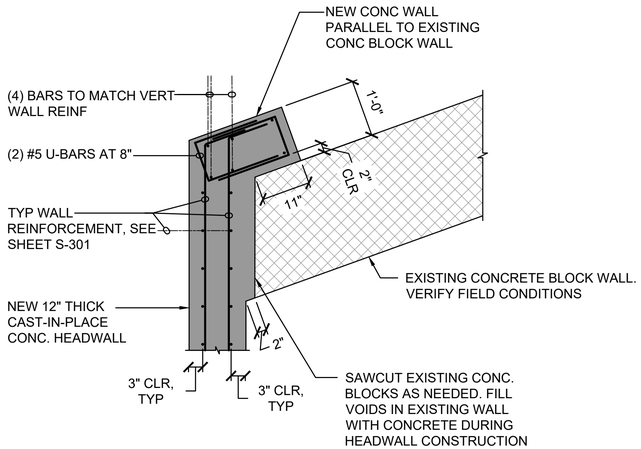
H1 TYPICAL CAST-IN-PLACE WALL CORNER BEND DETAIL
SCALE: NTS



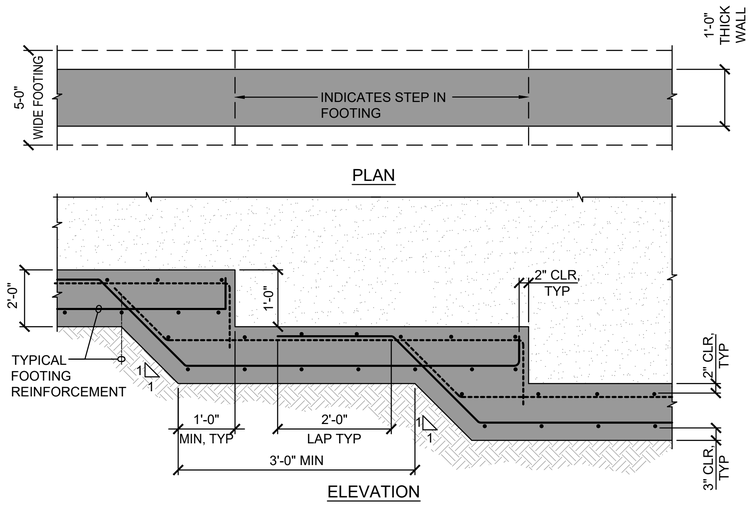
BOTTOM SLAB JOINT

WALL JOINT

H8 TYPICAL CAST-IN-PLACE CONSTRUCTION JOINT DETAIL
SCALE: NTS

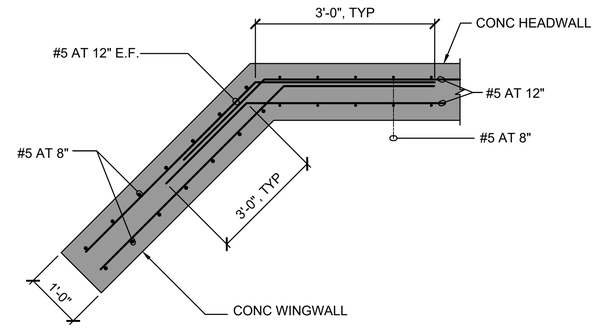


A1 CAST-IN-PLACE CONNECTION DETAIL TO EXISTING CONC. BLOCK WALL
SCALE: NTS



NOTES:
1. DO NOT PLACE HELICAL PILES ON SLOPED PORTION OF STEP FOOTINGS.
2. MAINTAIN 4" MIN COVER BETWEEN TOP OF FOOTING AND FINISH GRADE.
3. CONTRACTOR TO VERIFY NUMBER OF STEPS.

A8 TYPICAL STEP FOOTING DETAIL
SCALE: NTS



A15 WINGWALL CONNECTION DETAIL
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. SAIF	ISSUE DATE: TBD
DRAWN BY: CAD	SOLICITATION NO.: TBD
CHECKED BY: J. FUJITA	CONTRACT NO.: TBD
SUBMITTED BY: J. FUJITA	RTA SUBMITTAL
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII

OKAHARA AND ASSOCIATES, INC.
201 MERCHANT STREET, SUITE 1650
HONOLULU, HI 96813

FORT SHAFTER FLATS INSTALLATION
ISLAND OF OAHU, HAWAII
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

TYPICAL DETAILS (BID OPTION 1)

SHEET ID
S-501

RTA SUBMITTAL

Attachment C: Kahauiki Stream Maintenance Dredging, Phase 2 Plans

FILE: P:\5801-585\05808.16 ACOE - Kahauiki Stream Maintenance Dredging, Phase 2 CLIN 2\050 Drawings\Structural\AutoCAD_format\2025-05-09_5808-16 Stream Dredging Headwall
USER: CSAIF
PLOTTED: 5/9/2025 11:01 AM

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

JAN 08 2020

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Dr. Alan Downer
Deputy State Historic Preservation Officer
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
601 Kamōkila Boulevard
Kapolei, Hawai'i 96707

Dear Dr. Downer:

This letter is to inform you that the U.S. Army Garrison, Hawaii (USAG-HI) has completed the requirements under Section 106 of The National Historic Preservation Act for the proposed dredging of Kahauiki Stream at Fort Shafter Flats (Project #: CRS-19-103).

On November 18, 2019 the State Historic Preservation Division received the consultation letter and required documentation from USAG-HI transmitting the Army's finding of *no adverse effect*. The 30-day review period has now closed. USAG-HI received no response from the State Historic Preservation Officer and no objections from any consulting party. In accordance with 36 CFR §800.5(c)(1), USAG-HI will now proceed with the undertaking as described.

Should you have any questions, please contact Mr. Richard Davis, Cultural Resources Manager in the USAG-HI Directorate of Public Works, Environmental Division. He can be reached at (808) 655-9709 or richard.d.davis154.civ@mail.mil.

Sincerely,

Rhonelle K. Sugaki

for Kent K. Watase, PE
Director of Public Works

Attachment D: State Historic Preservation Division (SHPD) Coordination

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Dr. Alan Downer
Deputy State Historic Preservation Officer
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
601 Kamōkila Boulevard
Kapolei, Hawai'i 96707

Dear Dr. Downer:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

USAG-HI respectfully requests your review and response within 30 days of receipt of this letter. If you have any objections to the finding, please reply in writing with specific reasons for the disagreement.

Attachment D: State Historic Preservation Division (SHPD) Coordination

Should you have any questions, please contact Mr. Richard Davis, Cultural Resources Manager in the USAG-HI Directorate of Public Works, Environmental Division. He can be reached at (808) 655-9709 or richard.d.davis154.civ@mail.mil.

Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

Enclosures

Attachment D: State Historic Preservation Division (SHPD) Coordination

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Dr. Ha'aheo Guanson
Pacific Justice and Reconciliation Center
Native Hawaiian Church
1127 Bethel Street
Suite 16
Honolulu, Hawaii 96817

Dear Dr. Guanson:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Attachment D: State Historic Preservation Division (SHPD) Coordination

Should you have any questions, please contact Mr. Richard Davis, Cultural Resources Manager in the USAG-HI Directorate of Public Works, Environmental Division. He can be reached at (808) 655-9709 or richard.d.davis154.civ@mail.mil.

Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

Enclosures

Attachment D: State Historic Preservation Division (SHPD) Coordination

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Dr. Kamana'opono Crabbe
Office of Hawaiian Affairs
Attn: OHA Compliance Enforcement
560 North Nimitz Highway
Suite 200
Honolulu, Hawaii 96817

Dear Dr. Crabbe:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Attachment D: State Historic Preservation Division (SHPD) Coordination

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Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

Enclosures

Attachment D: State Historic Preservation Division (SHPD) Coordination

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mr. Harry Wasson
Hui Malama 'Aina 'O La'ie
Mahi'ai, Ki'ai
55-740 Kamehameha Highway
La'ie, Hawaii 96762

Dear Mr. Wasson:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

Enclosures

Attachment D: State Historic Preservation Division (SHPD) Coordination

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Dr. Kahu Kaleo Patterson
Pacific Justice and Reconciliation Center
1127 Bethel Street
Suite 16
Honolulu, Hawaii 96817

Dear Dr. Patterson:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

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947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Ms. Lani Ma'a Lapilio
Ma'a 'Ohana
PO Box 6087
Kāne'ohe, Hawaii 96744-9998

Dear Ms. Lapilio:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

USAG-HI respectfully requests your review and response within 30 days of receipt of this letter. If you have any objections to the finding, please reply in writing with specific reasons for the disagreement.

Attachment D: State Historic Preservation Division (SHPD) Coordination

Should you have any questions, please contact Mr. Richard Davis, Cultural Resources Manager in the USAG-HI Directorate of Public Works, Environmental Division. He can be reached at (808) 655-9709 or richard.d.davis154.civ@mail.mil.

Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

Enclosures

Attachment D: State Historic Preservation Division (SHPD) Coordination

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mr. Norman Mana Kaleilani Cáceres
'Ohana Huihui
91-225 Pilipiliula Place
Kapolei, Hawaii 96707

Dear Mr. Cáceres:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Kent K. Watase, PE
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947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
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NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Ms. Kilinahe Keliinoi
'Ohana Kahekilinuiahumanu
89-107 Nanaikala Street
Wai'anae, Hawaii 96792

Dear Ms. Keliinoi:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Kent K. Watase, PE
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Enclosures

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HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
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SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mr. Kyle Kajihiro
Ms. Terrilee Keko'olani
Hawai'i Peace and Justice
2426 O'ahu Avenue
Honolulu, Hawaii 96822

Dear Mr. Kajihiro and Ms. Keko'olani:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Sincerely,

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Director of Public Works

Enclosures

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947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
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SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mr. Farden Hailama
President,
Association of Hawaiian Civic Clubs
PO Box 1135
Honolulu, Hawaii 96807

Dear Mr. Hailama:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Sincerely,

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Kent K. Watase, PE
Director of Public Works

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947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

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SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Ali'i Sir Nathan Grace
Royal Order of Kamehameha I
Moku 'o Kōhala
74-962 Kealakehe St
Kailua-Kona, Hawaii 96740

Dear Ali'i Sir Grace:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Sincerely,

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Kent K. Watase, PE
Director of Public Works

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Mr. Shad Kane
Chair,
Preservation of Historic Sites & Cultural Properties Committee
O'ahu Council of Hawaiian Civic Clubs
92-1309 Uahanai Street
Kapolei, Hawaii 96707

Dear Mr. Kane:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

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947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
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NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mr. Melvin K. Soong
The I'Mua Group
422 Iliaina Street
Kailua, Hawaii 96734

Dear Mr. Soong:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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NOV 1 5 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mr. Tom Lenchanko
Hawaiian National
Kahuakai Ola Ko Laila Waha Olelo 'Aha Kūkaniloko
Ko'a Mana Mea Ola Kanaka Mauli Hoalii Iku Pau
931 Uakaniko'o Street
Wahiawā, Hawaii 96786

Dear Mr. Lenchanko:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Mr. William J. Aila , Jr.
and Mrs. Melva N. Aila
Hui Mālama O Mākua
86-360 Lualualei Homestead Road
Wai'anae, Hawaii 96792

Dear Mr. Aila:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Mrs. Donna Ann K. Camvel
46-522 Haiku Plantation Drive
Kāne'ohe, Hawaii 96744

Dear Mrs. Camvel:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Ms. Kiersten Faulkner
Executive Director,
Historic Hawaii Foundation
Dole Office Building
680 Iwilei Road, Suite 690
Honolulu, Hawaii 96817

Dear Ms. Faulkner:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

USAG-HI respectfully requests your review and response within 30 days of receipt of this letter. If you have any objections to the finding, please reply in writing with specific reasons for the disagreement.

Attachment D: State Historic Preservation Division (SHPD) Coordination

Should you have any questions, please contact Mr. Richard Davis, Cultural Resources Manager in the USAG-HI Directorate of Public Works, Environmental Division. He can be reached at (808) 655-9709 or richard.d.davis154.civ@mail.mil.

Sincerely,

Rhonda S. Sumpter for

Kent K. Watase, PE
Director of Public Works

Enclosures

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DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

NOV 15 2019

SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review

Ms. Kēhaulani Souza
94-115 Puanane Loop
Miliani, Hawaii 96789

Dear Ms. Souza:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

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Ms. Paulette Ka'anohiokalani Kaleikini
'Ohana Keaweamahi
89-107 Nanaikala Street
Wai'anae, Hawaii 96792

Dear Ms. Kaleikini:

On behalf of the Garrison Commander, I am writing to open consultation with you pursuant to Section 106 of The National Historic Preservation Act regarding the proposed maintenance and dredging of lower Kahauiki stream at Fort Shafter Flats, Fort Shafter Military Reservation. The proposed action is a Federal undertaking that may have the potential to cause effects on historic properties, per 36 CFR 800.3(a).

The Fort Shafter Flats area is at risk of flooding due to build-up of sediment in the canal. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain. The proposed undertaking is for periodic maintenance to remove built up silt and vegetation debris. The area of potential effects (APE) is the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres. U.S. Army Garrison, Hawaii (USAG-HI) needs to maintain the canal to lower flooding risks.

USAG-HI is proposing a finding of *no adverse effect* for this undertaking. Two historic properties have been identified within the project area (State Inventory of Historic Places site numbers 50-80-14-75 and 50-80-14-5365). For the purposes of Section 106 USAG-HI is considering these eligible for the National Register of Historic Places. Enclosure 1 includes all information required by 800.11 (e) to support this finding. Enclosure 2 contains a list of consulting parties notified about this proposed finding and invited to comment on this undertaking.

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Description of the Undertaking per 36 CFR 800.11 (e) (1)

The Fort Shafter Flats area is susceptible to flooding. Areas adjacent to the Kahauiki stream fall within the 50-year floodplain (Figure 1). The Army modified this portion of the stream into a canal ca. 1942-1943. The majority of the canal is of earthen construction. Two walls constructed of basalt, one masonry and one-stacked, retain a section of the canal bank. Heavy vegetation growth in and adjacent to the canal, including shrubs, trees, and mangroves restricts stream flow. This can redirect floodwaters and cause extensive property damage. U.S. Army Garrison, Hawaii (USAG-HI) needs to remove sediment in the canal to lower flooding risks.

Description of Work
The site plan illustrates the limits of work described below (Figure 2). The area of potential effects (APE) includes the canal, the banks of the canal, the contractor operations and storage area (COSA), and the dewatering area, which is approximately 10 acres (Figures 3 and 4).

- Dredging Sediment from the Canal: Maintain the canal by removing the built up silt and debris by dredging. Dredging with heavy equipment to remove accumulated silt within the extent of the constructed canal. To ensure impact to the wall is avoided no ground disturbance will occur within 3 feet (ft).Contractors will place appropriate markers to demarcate the buffer area.

- Vegetation Removal Adjacent to the Canal: Work will entail grubbing, pruning, and removing vegetation along banks. Mangroves are the primary vegetation targeted for removal.

- Dewatering Area: The adjacent athletic field will serve as a dewatering area for the silt removed from the canal. The drying process usually takes approximately 60 days. Once silt is dried, it will be disposed of off-site. There will be no subsurface disturbance at the dewatering area. Restoration of the athletic field is a requirement of use of the field for dewatering.

- Contractor Operations and Storage Area (COSA): An adjacent athletic field will serve as the COSA. There is no subsurface disturbance associated with use as a COSA with the exception of installing safety fencing, roughly 2ft deep for the fence posts.

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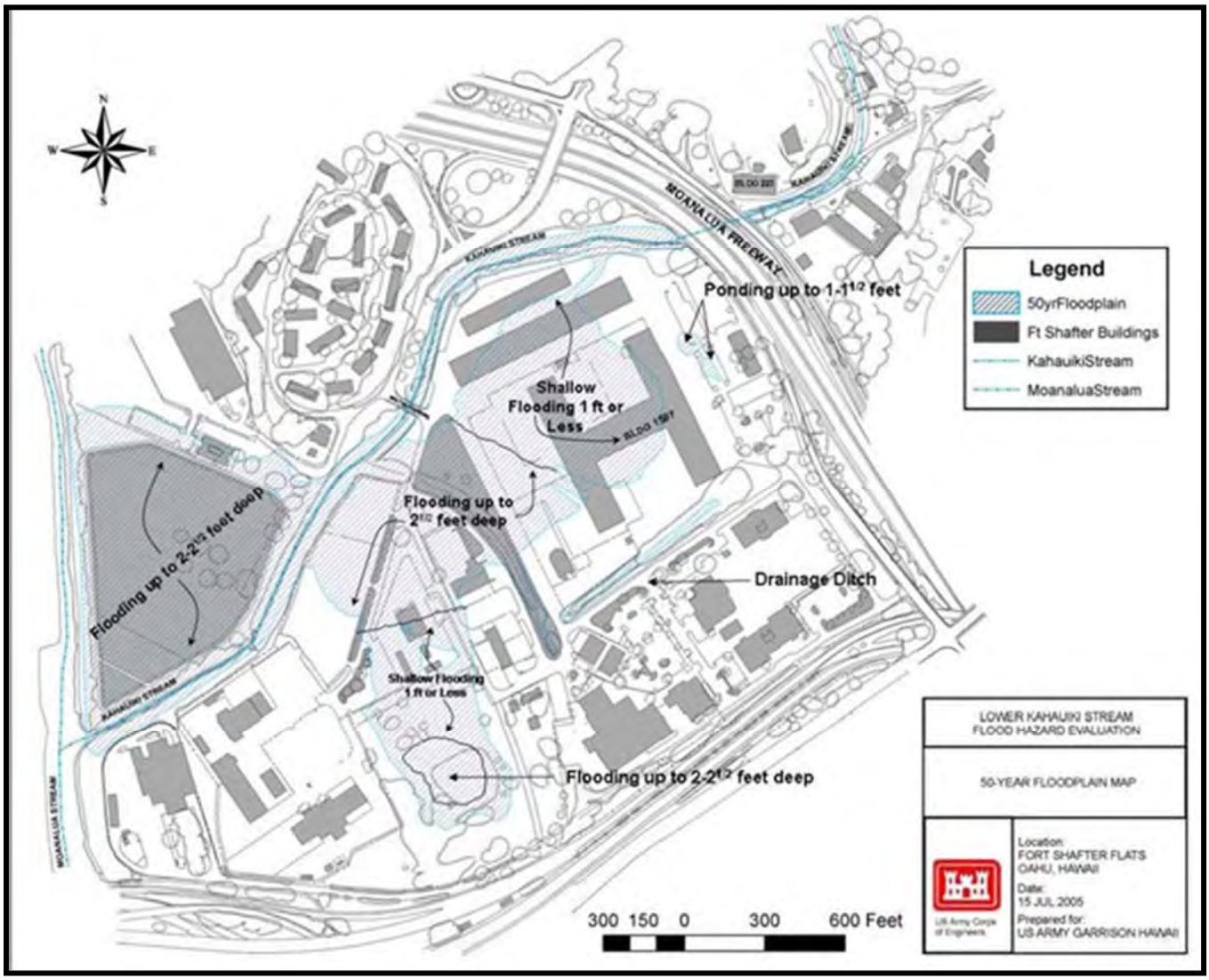

Figure 1: Fort Shafter Flats - 50 year Floodplain.

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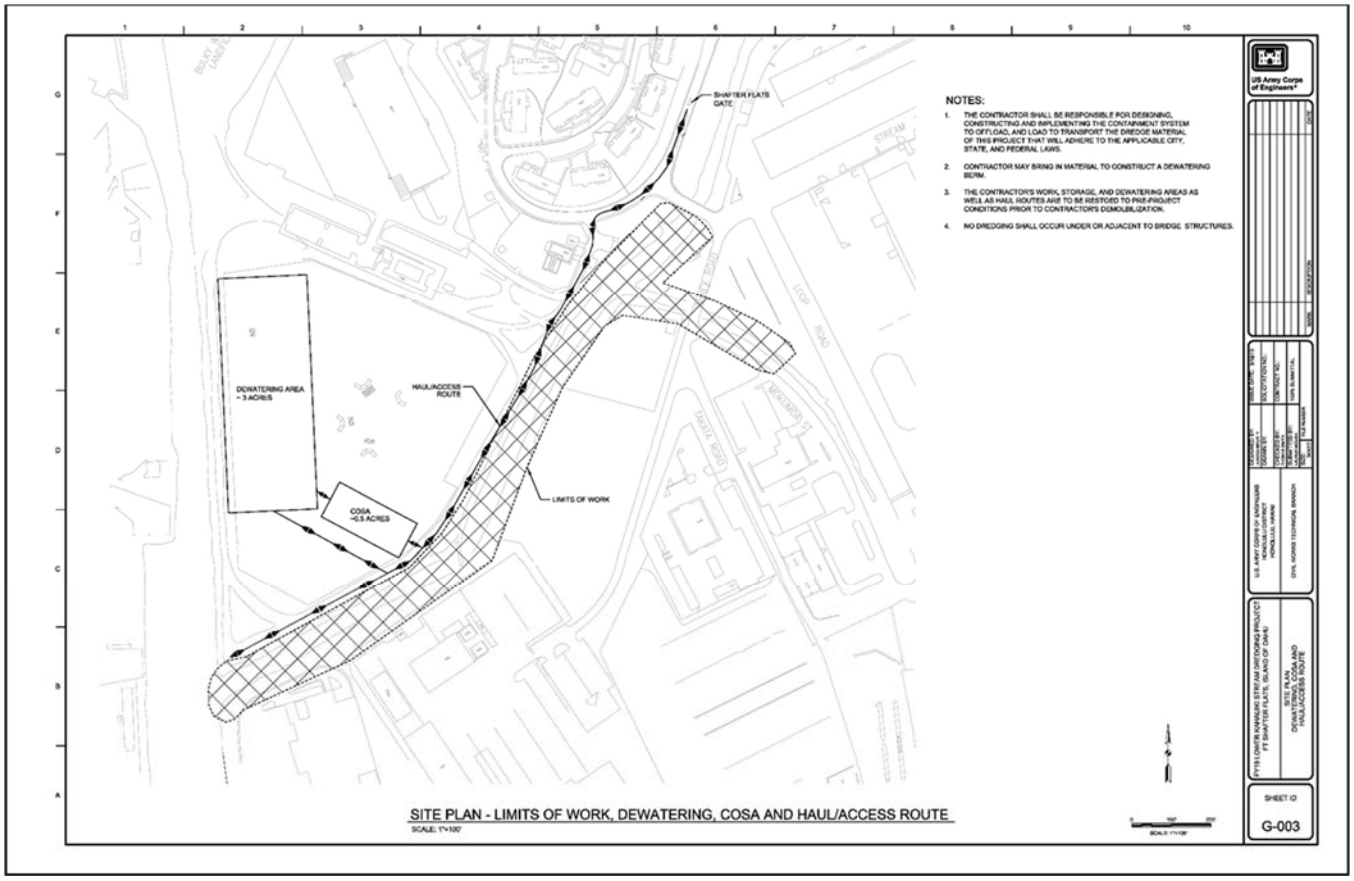

Figure 2. Project Site Plan.

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Figure 3: Area of Potential Effects.

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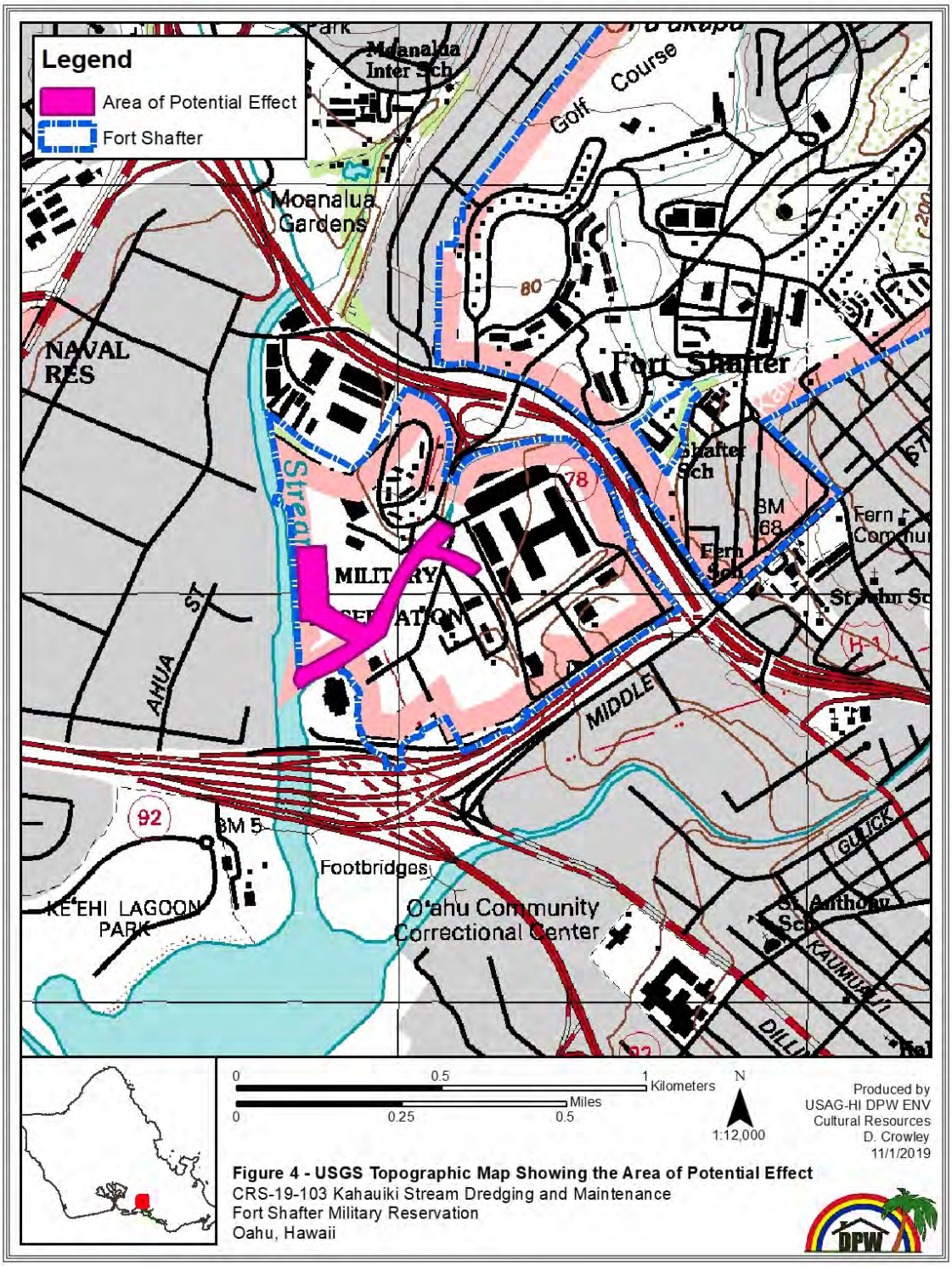

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Steps to Identify Historic Properties and Description of Results per 36 CFR 800.11 (e)(2) and (3)

The USAG-HI Cultural Resources Section has made reasonable and good faith efforts to carry out appropriate identification efforts, which included; background research, involving the review of archaeological reports and surveys; and archival research, which resulted in the discovery of historic maps and photographs that depict historic fishponds and other structures once in the area (Figures 5 and 6).

Historic properties in and near the project area include locations of two former Hawaiian fishponds, Weli and Ka'ikikapu. They are assigned State Inventory of Historic Places (SIHP) site numbers 50-80-14-75 and 50-80-14-5365, respectively. Previous land use in Kahauiki Ahupua'a includes fishponds and agriculture. Historical maps depict mud flats and rice fields in the southwestern half of Fort Shafter Flats and wet lands just northeast of where Weli and Ka'ikikapu ponds were situated. In the early 1900s OR & L was granted a right-of-way north of Weli and Ka'ikikapu fishponds.

Williams and Anderson (1997) analyzed pollen and stratigraphy from core samples taken in the Fort Shafter area. The results were compared to a previous study by Wickler et al. (1991) the results were similar in terms of ages and types of pollen but the conclusions differed. Williams and Andersen suggested that "rather than being a pristine depositional environment well suit for paleoenvironmental study, the Fort Shafter Flats area is instead made up of a series of deposits representing repeated erosion and redepositing, thus making it less ideal for studying paleoenvironmental and anthropogenic change" (Williams and Anderson 1997:i). Taking into account the fact that the Fort Shafter Flats area is situated in the 50 year floodplain the author's conclusion is reasonable.

In 2000 Tomonari-Tuggle et al. described the installation's historic and cultural resources. These resources range from Hawaiian archaeological sites to World War II defense sites and other military historic properties within the boundaries of Fort Shafter. This report discussed two former Hawaiian fishponds, Weli and Ka'ikikapu, adjacent to the project area. Weli Pond would have been located southeast of Funston Road and Ka'ikikapu Pond southwest of Funston Road. Both ponds were completely filled by the mid-1940s with dredged material from Ke'ehi Lagoon (Thompson 1982: 99).

Tomonari-Tuggle et al. (2000) took core sediment samples within Weli and Ka'ikikapu Ponds. That investigation identified fill material down to depths of 9.7 feet (ft) at Ka'ikikapu Pond, and 11.2 to 12 ft at Weli Pond (Figure 7). Analysis of the sediment is described in Figures 8, 9 and 10. A revised 1945 Corps of Engineers plan of grading map illustrates the fill depths above Weli pond and shows a stock pile to the east. This map records the fill depths as Fill 9.1 to 13 ft (Figure 11).

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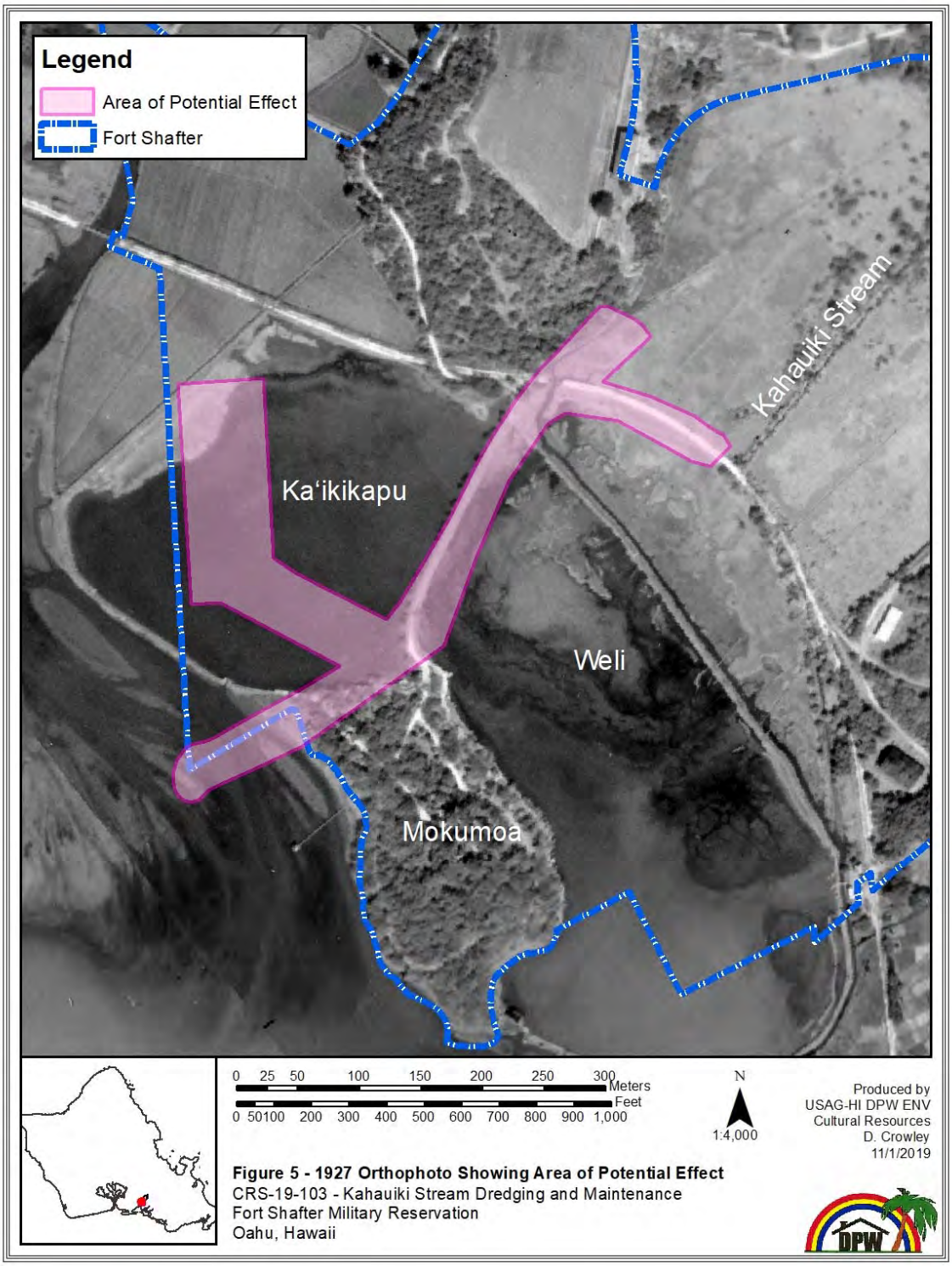

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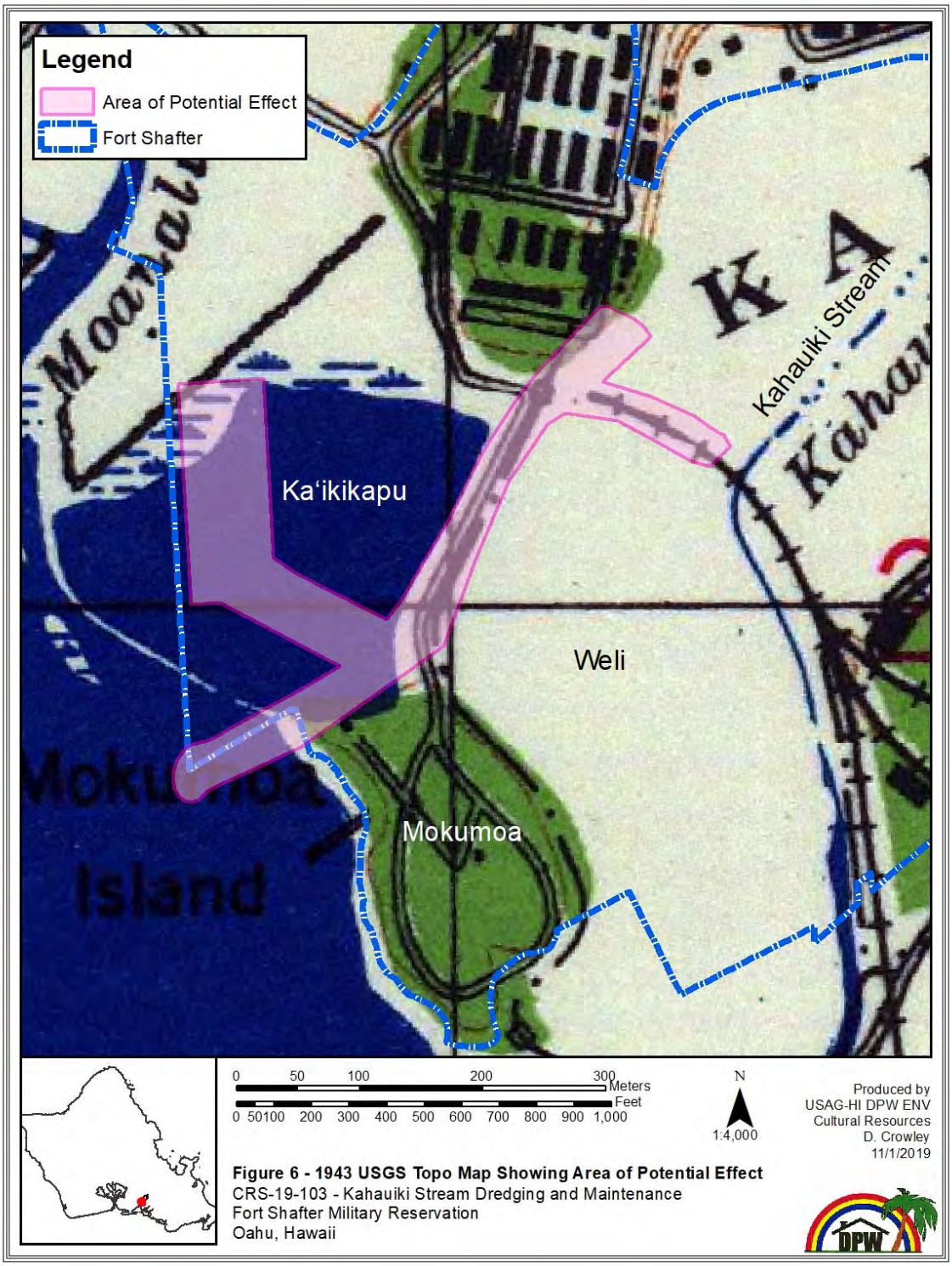

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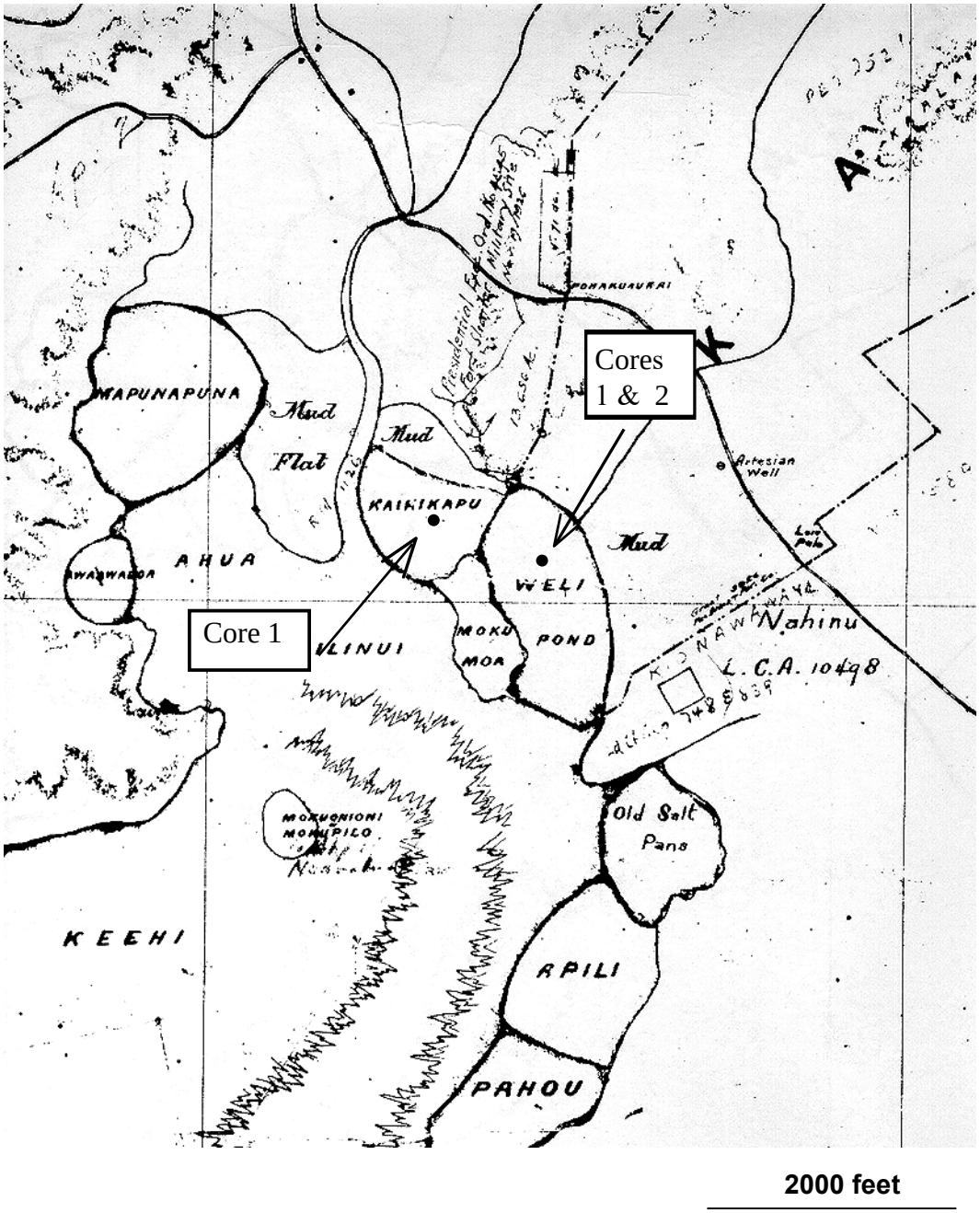

Figure 7. Portion of Lyons and Monsarrat (n.d.) Land Survey Map (Register Map 1511) Showing Core Locations at Ka‘ikikapu and Weli Fishponds (Adapted from Tomonari-Tuggle, et al. 2000:F-6).

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Table F-1. Sediment Description, Kaikikapu Pond, Core 1.

Layer	Depth (cm)	Munsell Color (dry)	Sediment Description
Ia	0-20	brown	fill, loam
Ib	20-80	light tan	fill, coralline sand, gravel, and pebbles
Ic	80-180	-	fill, basalt boulders; water table at 160 cm bs
Id	180-270	light tan	fill, coralline sand, gravel, pebbles
Ie	270-296	light tan	fill, sand; abrupt lower boundary
II	296-348	10YR 5/1 grey	gleyed clay loam with calcareous sand; sand becomes much more plentiful in lower half of layer; slightly sticky (upper) to non-sticky (lower), plastic; abrupt lower boundary
III	348-361	10YR 4/1 dark grey	gleyed clay loam with very little sand; top two centimeters of layer has several light tan bands of silt suggesting possible fill event; several pieces of basalt gravel dispersed in layer; slightly sticky, plastic; abrupt lower boundary
IV	361-374	10YR 4/2 dark greyish brown	loam with fine basaltic sand; thin-shelled bivalve at 370 cm but otherwise little indication of marine detritus; slightly sticky, plastic; abrupt lower boundary
V	374-384	10YR 4/1 dark grey	gleyed clay loam; marine detritus (finely fragmented shell) and calcareous sand; slightly sticky, plastic; diffuse lower boundary
VI	384-413	10YR 4/1 dark grey	sandy loam with medium to coarse basaltic sand; wood fragments common, including *kukui* nut shells; non-sticky, slightly plastic; abrupt lower boundary
VII	413-421	10YR 4/1 dark grey	loam with mixed basalt and calcareous sand with small amount of marine detritus; non-sticky, plastic; abrupt lower boundary
VIII	421-454+	10YR 4/1 dark grey	sandy loam with fine basaltic sand and some calcareous sand; marine detritus (shell fragments) much more abundant than Layer VII; wood is present, though less common than Layer VII

Figure 8. Ka‘ikikapu Pond Core 1- Sediment Description (Tomonari-Tuggle et al. 2000: F25).

Table F-2. Sediment Description, Weli Pond, Core 1.

Layer	Depth (cm)	Munsell Color (dry)	Sediment Description
Ia	0-20	brown	fill consisting of loam top soil
Ib	20-328	light tan	fill consisting of coralline sand, gravel, and pebbles; predominantly sand below 306 cm; wood at 320-323 cm
Ic	328-340	10YR 8/1 white	fill consisting of silt loam, finely banded; wood at 337-339 cm; abrupt lower boundary
Id	340-343	10YR 7/1 light grey	fill consisting of gleyed clay; abrupt lower boundary
II	343-354	10YR 4/2 dark greyish brown	see Core 2; palm root extends downward from top of layer to 350 cm
III	354-357	10YR 4/1 dark grey	see Core 2; possible fishpond layer, but truncated due to possible rodding of the core segment
IV	373-404	10YR 3/2 very dark greyish brown	see Core 2 (becomes greyer with depth)
V	404-442	10YR 4/1 dark grey	see Core 2
VI	442-549	10YR 4/1 dark grey	see Core 2
VII	549-564+	10YR 4/1 dark grey	see Core 2

Layer V could possibly represent fishpond sediments. This attribution, however, is uncertain based on purely morphological grounds. As construction of a fishpond would be expected to result in a sharp change in depositional conditions, an abrupt boundary rather than the actual diffuse boundary would be expected (as has been observed in other fishponds). It is possible, however, that the change from a quiescent embayment to a fishpond represented only a relatively minor change in depositional conditions, and thus the expectation for an abrupt shift in the sedimentary record is incorrect in this situation. In order to help resolve this interpretive problem, both diatom samples and stable carbon isotope samples were analyzed from the full column of sediments in Core 2. Details regarding these analyses are presented below.

It is perhaps notable that the Layer V sediments are characterized by more of a brown hue (as is Layer IV) in contrast to the lower layers. This may indicate reduced dispersion of water entering the putative fishpond from Kahauiki stream, though it could also represent an increase in terrestrial erosion carried by the stream as a result of Hawaiian settlement and agriculture in the Kahauiki watershed.

Figure 9. Weli Pond Core 1 - Sediment Description (Tomonari-Tuggle et al. 2000: F26).

Table F-3. Sediment Description, Weli Pond, Core 2.

Layer	Depth (cm)	Munsell Color (dry)	Sediment Description
I	367	-	fill, mostly coralline material (see Core 1 description)
II	367-370	10YR 4/1 dark grey	gleyed silty clay with plentiful fibrous plant material; slightly sticky, plastic; lower boundary diffuse
III	370-380	10YR 4/1 dark grey	gleyed silty clay but less fibrous plant material than Layer II; slightly sticky, plastic; dense band of small snails of Hydrobiidae (possibly *Tryonia* sp.) and Thiaridae (*Tarebia granifera* and possibly *Melanoides tuberculata*) between 377-380 cm; seeds of *Ruppia maritima* common; lower boundary somewhat diffuse
IV	380-415	5YR 4/2 dark reddish grey 5YR 3/1 very dark grey	silty clay, but higher clay content than Layer III; banded for entire length, alternating between dark reddish grey and very dark grey; sticky, plastic; absence of marine material; abrupt lower boundary
V	415-456	10YR 4/2 dark greyish brown	essentially same as Layer IV but no longer banded; by 445 cm sediment takes on a greyer hue and very small amount of small calcareous marine detritus begins to appear; lower boundary diffuse
VI	456-541	10YR 4/1 dark grey	gleyed silty clay with small amount of small calcareous marine detritus; fine bivalves begin to appear at ca. 493 cm; sticky, plastic; indurated calcareous silt peds (10YR 7/1) present between 524-528 cm; they are rounded and irregular in shape; lower boundary diffuse over 2 cm thick boundary area
VII	541-614	10YR 5/1 grey	gleyed silt loam; indurated silt peds as in Layer VI present at 570 cm; fragments of *Brachidontes* sp. shell; non-sticky, plastic; abrupt lower boundary
VIII	614-761+	10YR 5/1 grey	gleyed silty clay loam; between 614-618 cm there are a substantial number of indurated silt peds as in Layers VI and VII; dispersed and infrequent fragments of *Brachidontes* sp. shell; fine calcareous sand which decreases with depth; slightly sticky, plastic; layer continues below point at which coring terminated

Figure 10. Weli Pond Core 2 - Sediment Description (Tomonari-Tuggle et al. 2000: F27).

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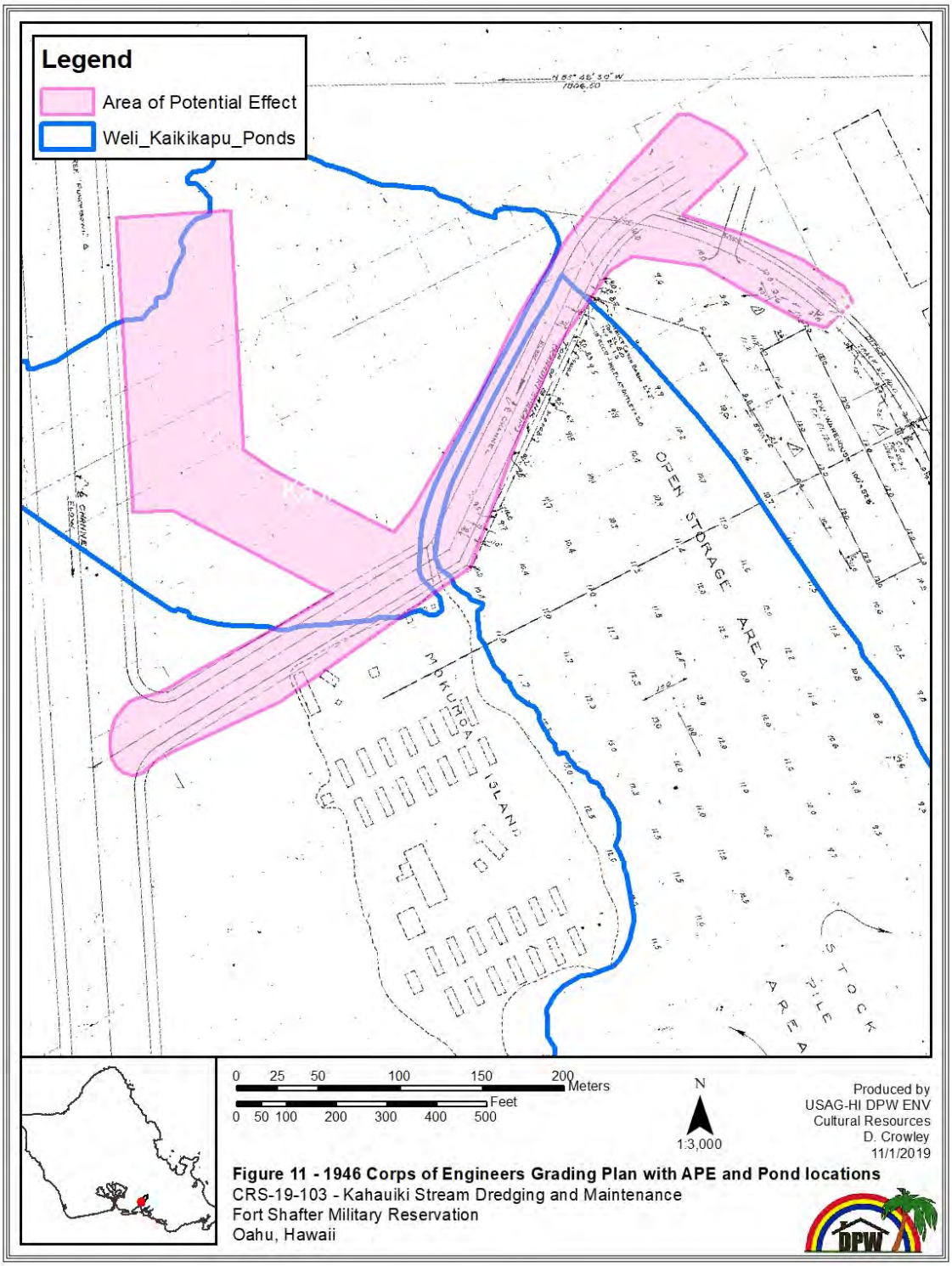

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In 2000 Eble and Anderson recorded a wall located in between two former fishponds Weli and Ka'ikipkapu. The wall was interpreted to be historic, likely a modified section of the buried fishpond wall (2000:60). This section of the fishpond wall was most likely altered by the construction of the OR&L railroad that crossed Kahauiki Stream near this locality (see Figure 5). A 1942 land survey map illustrates the paved road and a guard rail next to the road (Figure 12). It is possible that the guardrail is the current basalt mortared wall segment that sits atop the basalt stacked wall. A portion of the OR & L railway is also visible on this 1942 map. It can be seen that the railway stops east of Kahauiki stream (see Figures 6 & 12).

In 2002 Roberts et al. conducted a project near the APE. During this project a 3.5 by 2 meter test unit was excavated at the west bank of Kahauiki stream, which was bound by a mortared retaining wall and a stacked wall (Figure 13 and 14). Beneath the stacked wall two Tamarack logs were identified (Roberts et al. 2002:35). Tamarack is a deciduous tree from Northern North America (Roberts et al. 2002:Appendix D). Tamarack would most likely not have arrived to Hawaii until after post-Contact. Roberts et al. suggested the wall segment had previously separated Weli and Ka'ikikapu fishponds (Roberts et al. 2000:32).

McAllister (1933:91) described Weli fishpond:

> *Said to be 30 acres in area. The greater part of its walls appear to be earth embankment, mostly natural. It is now separated from Kaikikapu pond by a road way. Kaikikapu is 20 acres in area with a wall from Mokumoa Island to Moanaloa 900 feet long.*

Historic photos and maps depict a roadway leading to what was once Mokumoa Island (see Figures 5 and 6). Currently is unclear on whether the identified wall served as a retaining wall for the roadway, the fishpond wall, or was rebuilt during the construction of the present day canal (Figure 15).

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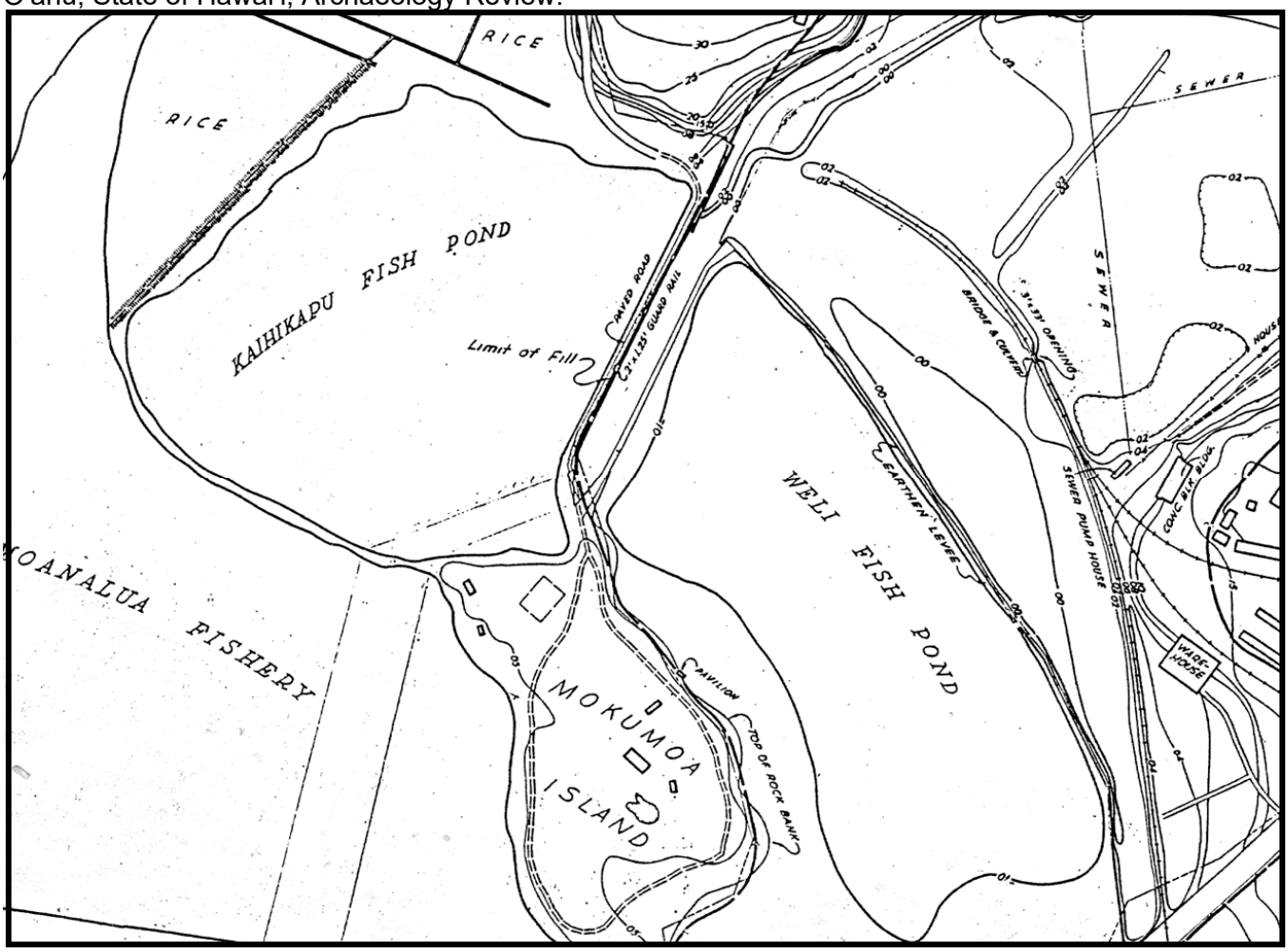

Figure 12. Portion of 1942 Land Survey Map of Fort Shafter Illustrating Weli and Ka‘ikikapu (misspelled Kaihikapu) fishponds (U.S. Engineering Office 1942).

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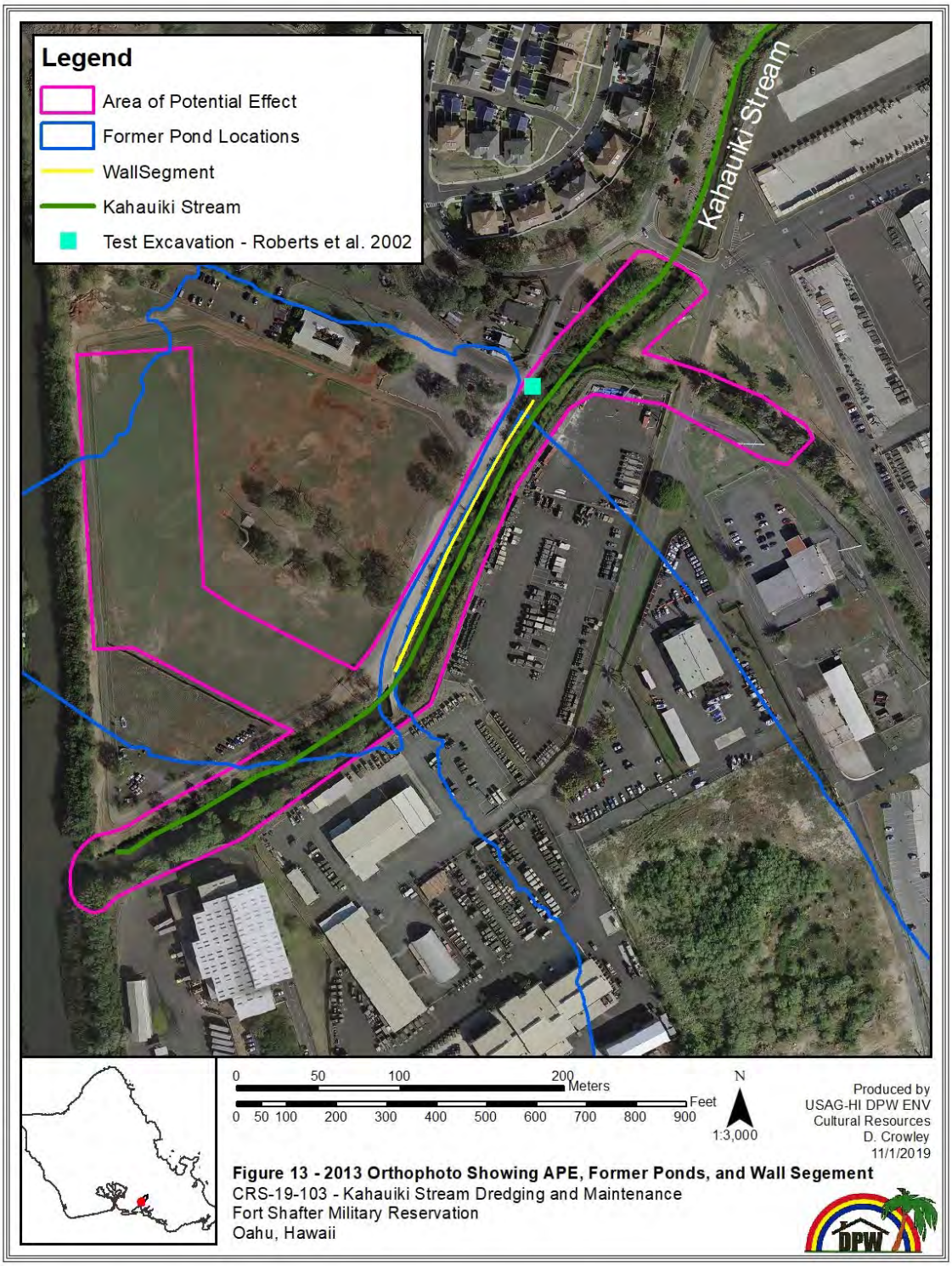

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Photograph: 1 Direction: SW Date: 7/25/00
Comments: Test unit excavation showing fishpond wall and soil stratigraphy.

Photograph: 2 Direction: W Date: 7/25/00
Comments: View of test unit excavation from east bank of Kahauiki Stream.

Figure 14. Showing Test Excavation Location (Appendix A, page 1).

Wall: view south.

Wall: view west.

Figure 15. Photographs Showing Basalt Walls along Kahauiki Canal.

Enclosure 1
SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i; Archaeology Review.

Application of Criteria of Adverse Effects and Description of Effects 36 CFR 800.11 (e) (4) and (5):

For the purpose of Section 106 the USAG-HI considers sites 50-80-14-75 and 50-80-14-5365 are eligible under criteria D. The USAG-HI finds that criteria for adverse effect have not been met for this undertaking. Though historic properties are present beneath the APE, the USAG-HI finds that the undertaking will not cause any adverse effects upon them because they are located at levels well below where the activities (COSA and dewatering area) required to execute the undertaking are taking place. Dredging and vegetation removal will only remove built-up sediments and debris with no additional ground disturbance beneath the constructed canal. A three foot buffer will be in place within the APE to avoid disturbing the wall on the western bank of the canal.

- Weli fishpond: There are no adverse effects to Weli fishpond because this portion of the pond has been heavily disturbed. Weli fishpond has been completely filled in since the early 1940s, a fill layer of approximately 11 ft deep or more has been documented. Ground disturbing activities will only take place within the canal. The canal is located on the western side of Weli pond. The Army redirected Kahauiki stream when the canal was built (ca. 1942-1943). Fill was used to create earthen berms on the western side of the canal and it is possible that materials from the fishpond wall were reused to create the stacked wall on the eastern side of the canal. There are no anticipated archeological findings within the canal because water has flowed through it for over 70 years. Additionally the fishpond and canal lie in a floodplain, repeated flooding, erosion and redepositing of sediment has occurred over the years.

- Ka'ikikapu fishpond: There are no adverse effects to Ka'ikikapu fishpond because the pond has been completely filled in since the early 1940s, a fill layer of approximately 9.5 ft or more has been documented. The southeast portion of Ka'ikikapu has been heavily disturbed during the construction of the canal. Ground disturbing activities will only take place within the canal. The canal is located along the eastern and southeast sides of Ka'ikikapu pond. The Army redirected Kahauiki stream when the canal was built (ca. 1942-1943). It is possible that materials from the fishpond wall were reused to create the stacked wall on the eastern side of the canal. There are no anticipated archeological findings within the canal because water has flowed through it for over 70 years. Additionally the fishpond and canal lie in a floodplain, repeated flooding, erosion and redepositing of sediment has occurred over the years

- Basalt walls: There are no adverse effects to the mortared wall or the stacked wall because the scope of the contract will call for a 3 ft buffer on both sides of the wall which will ensure that any equipment used will not damage the wall. Other safeguards such as markers will also be in place to aid in avoidance. The mortared wall was constructed in the early 1940s and served as a guardrail. The stacked wall is thought to have been built during construction of the canal, possibly reusing materials from the fishpond wall.

- OR&L railway lane: There are no adverse effects to the OR&L railway as the railway has been completely removed from the project area. The former OR&L railway once crossed over what is now Kahauiki stream. The railway had been completely removed east of the APE by the early 1940s. There are no anticipated archeological findings here as there are no physical remnants of the railway within the canal and APE.

Enclosure 1
SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua‘a, Honolulu District, Island of O‘ahu, State of Hawai‘i; Archaeology Review.

References:

Eble, Francis J., and Lisa Anderson
2000 *Archaeological Monitoring and Sampling Conducted During Construction Repair for Force Main, Tripler Army Medical Center to Sand Island Sewage Plant; Oahu Island, Hawaii*. Prepared for U.S. Army Corps of Engineers, Honolulu District, by Ogden Environmental and Energy Services, Inc.

McAllister, J. Gilbert
1933 *Archaeology of Oahu*, B.P. Bishop Museum Bulletin 104. Bishop Museum Press, Honolulu.

Roberts, Alice K.S., Stephen J. Roberts and C. Celeste LeSuer
2002 *Archaeological Monitoring and Sampling for Outside Cable Rehabilitation (OSCAR) Project*, Fort Shafter Military Reservation, O‘ahu Island, Hawai‘i.

Thompson, Erwin N.
1982 *Pacific Ocean Engineers: History of the U.S. Army Corps of Engineers in the Pacific 1905-1980*. U.S. Army Corps of Engineers, Washington D.C.

Tomonari-Tuggle, M.J., Stephen Hamilton, and Katharine Slocumb
2000 *Fort Shafter Cultural Resource Investigations at Hawai‘i’s First Military Outpost*. Prepared for U.S. Army Corps of Engineers, Honolulu District, by International Archaeological Research Institute.

Williams, Scott and Lisa Anderson
1197 *Archaeological monitoring and Sampling During Construction for FY 88 SR PN67 Warehouse/Administrative Facility, Shafter Flats, O‘ahu Island, Hawaii*. Prepared for U.S. Army Engineer District, Honolulu, by Ogden Environmental and Energy Services, Inc., Honolulu.

U.S. Engineer Office
1942 Plan of Fort Shafter Showing Buildings, Utilities, and Appurtenances.

Attachment D: State Historic Preservation Division (SHPD) Coordination

ENCLOSURE 2
SUBJECT: National Historic Preservation Act Compliance for Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupuaʻa, Honolulu District, Island of Oʻahu, State of Hawaiʻi; Archaeology Review

Distribution List

Mr. William J. Aila , Jr. and Mrs. Melva N. Aila Hui Mālama O Mākua	Mr. Norman Mana Kaleilani Cáceres ʻOhana Huihui
Mrs. Donna Ann K. Camvel	Dr. Kamanaʻopono Crabbe Office of Hawaiian Affairs Attn: OHA Compliance Enforcement
Dr. Alan Downer State Historic Preservation Division Department of Land and Natural Resources	Ms. Kiersten Faulkner Historic Hawaii Foundation
Aliʻi Sir Nathan Grace Royal Order of Kamehameha I Moku ʻo Kōhala	Dr. Haʻaheo Guanson Pacific Justice and Reconciliation Center Native Hawaiian Church
Mr. Farden Hailama Association of Hawaiian Civic Clubs	Mr. Kyle Kajihiro Ms. Terrilee Kekoʻolani Hawaiʻi Peace and Justice
Ms. Paulette Kaʻanohiokalani Kaleikini ʻOhana Keaweamahi	Mr. Shad Kane Preservation of Historic Sites & Cultural Properties Committee Oʻahu Council of Hawaiian Civic Clubs
Ms. Kilinahe Keliinoi ʻOhana Kahekilinuiahumanu	Ms. Lani Maʻa Lapilio Aukahi
Mr. Tom Lenchanko Kahuakai Ola Ko Laila Waha Olelo ʻAha Kūkaniloko Koʻa Mana Mea Ola Kanaka Mauli Hoalii Iku Pau	Dr. Kahu Kaleo Patterson Pacific Justice and Reconciliation Center
Mr. Melvin K. Soong The Iʻ Mua Group	Ms. Kēhaulani Souza
Mr. Harry Wasson Hui Malama ʻAina ʻO Laʻie Mahiʻai, Kiʻai	

Attachment D: State Historic Preservation Division (SHPD) Coordination

IMHW-PWE 31 December 2019

MEMORANDUM FOR

USAG-HI, DPW, ENVIRONMENTAL DIVISION NEPA PROGRAM (IMHW-PWE)
USAG-HI, DPW, ENGINEERING DIVISION (IMHW-PWF)

SUBJECT: REC # 4559 / Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i.

Directorate of Public Works (DPW), Cultural Resources Section has completed Section 106 consultation for the Kahauiki Stream dredging project at Fort Shafter Flats (REC 4559). U.S. Army Garrison Hawaii (USAG-HI) identified historic properties beneath and in the project area. To avoid any impacts to cultural resources, dredging and vegetation removal will only remove built-up sediments and debris with no additional ground disturbance beneath the constructed canal. The DPW Engineering Division will ensure that the project implements a 3 foot buffer to avoid disturbing the mortar and the stacked basalt wall on the western bank of the canal. DPW Engineering may place other safeguards such as markers to aid in avoidance.

Encl

PAMERLEAU-WALDEN.JACQUELINE.ANNE.1081444508

Digitally signed by PAMERLEAU-WALDEN.JACQUELINE.ANNE.1081444508
Date: 2019.12.31 12:11:13 -10'00'

Attachment D: State Historic Preservation Division (SHPD) Coordination

DIRECTORATE OF PUBLIC WORKS
ENVIRONMENTAL DIVISION (IMHW-PWE)
BLDG. 105, WHEELER ARMY AIRFIELD
U.S. ARMY GARRISON, HAWAII
SCHOFIELD BARRACKS, HI 96857-5013
PHONE: (808) 656-2878, FAX: (808) 656-1039

DPW
Environmental Division

Memo

To: Steve Lai
From: Alton Exzabe
Date: 02-Jan-2020
REC #: 4559
FEWR #: RB000857J
Re: Fort Shafter Flats Kahauiki Stream Dredging

Attached is the completed REC for the subject project. Please note compliance with the REC is contingent upon compliance with the comments from the below mentioned programs. Comments are either found in the Review and Concurrences section (page 5) or at the end of this document.

Failure to comply with these requirements may result in fines, penalties, and supplemental environmental project costs, which will be paid by the organization against which the fine or penalty has been assessed, using applicable Army appropriations unless otherwise required by law. Payments of fines and penalties will be charged to the funding account of the operation causing the violation. Contracting Officers will ensure that contracts require contractors to pay fines or penalties resulting from their operations (Army Regulation 200-1, Chapter 15-1, d.)

Please read this document and indicate your acceptance of the conditions by signing below and returning a copy to DPW Environmental.

The undersigned has read this REC and agrees to incorporate the listed environmental protective measures into the planning and execution of this project.

Proponent Signature X LAI.STEVE.CHAN.1167580528 Digitally signed by LAI.STEVE.CHAN.1167580528 Date: 2020.01.02 09:42:15 -10'00' Date 1/2/2020

If additional guidance is needed to meet these requirements, please contact the following personnel.

Natural Resources Program, Kapua Kawelo at 655-9189 or hilary.k.kawelo.civ@mail.mil

Cultural Resources Program, Richard Davis at 655-3087 or richard.d.davis154.civ@mail.mil

Clean Water Program, Melissa Evans-Shontofski at 656-7001 or melissa.l.evans-shontofski.civ@mail.mil

Clean Air/ Safe Drinking Water Program, Kim DeCaprio at 656-3107 or kimberly.c.decaprio.civ@mail.mil

Recycling Program, Dale Kanehisa at 656-5411 or dale.t.kanehisa-lam.civ@mail.mil

Attachment E: 01-02-2020 Record of Environmental Consideration

RECORD OF ENVIRONMENTAL CONSIDERATION

IMHW-PWE NEPA Office

REC #: 4559

REC CHECKLIST (Check before submitting)
☑ Detailed Project Description
☑ Location Map and Plans
☑ Date of Proposed Action
☑ Reason for Categorical Exclusion
☑ Impact Analysis Checklist

1. DATE: 05-Jun-2019

2. SUBMITTED BY THE PROPONENT:

Derek Sakai, DPW
Name, Organization

656-3066 derek.k.sakai2.civ@mail.mil
Phone Number Email

SAKAI.DEREK.K.1290294653 Digitally signed by SAKAI.DEREK.K.1290294653 Date: 2019.06.06 10:03:51 -10'00'
Signature

3. DESCRIPTION OF PROPOSED ACTION: FS | Flats Kahauiki stream | RB000857J
Installation | Location/Bldg No. | FEWR #

Fort Shafter Kahauiki Stream Dredging

Cut, clear and remove vegetation and sediment build up in the military controlled streams (Kahauiki) and drainage canals as shown on 100% design submittal. (see attached drawings)

Heavy vegetation, shrubs, and tree growth in the streams can restrict the stream flow and can cause flood waters to be redirected and cause massive military property damage when heavy storm water conditions are present.

Intent is to remove the heavy growth and sediments build up in the Kahauiki stream, so that the heavy storm waters may flow unabated away from FSF and into Keehi Lagoon.

Extent of work should NOT cause any adverse impacts to the surrounding community.

FEWR# RB000857J

4. ESTIMATED START DATE & DURATION OF PROPOSED ACTION: 1st Qtr FY20

5. THIS ACTION HAS BEEN COORDINATED WITH THE FOLLOWING OFFICES/AGENCIES:

Office/Agency	Name(s)	Concur/Non-Concur

Attachment E: 01-02-2020 Record of Environmental Consideration

RECORD OF ENVIRONMENTAL CONSIDERATION

ENVIRONMENTAL IMPACT ANALYSIS *(Any "YES" or "MAY" answers need to be explained in the "Discussion" section at the end of this checklist.)*	**YES**	**NO**	**MAY**
1. AIR QUALITY			
a. Will the proposal cause air emissions such as smoke, dust, suspended particles, or air pollutants during construction or operations?	☐	☐	☑
b. Will the proposal involve the removal, modification, or addition of an air emitting device (e.g., boilers, generators, or refrigerant containing equipment)?	☐	☑	☐
2. WATER QUALITY			
a. Is the total disturbance of land under one acre?	☐	☑	☐
b. Is the total area of new impervious surface under 5,000 square feet?	☐	☑	☐
c. Does the project involve an individual wastewater system (e.g., septic tank) or pretreatment unit (e.g., oil-water separator or grease trap)?	☐	☑	☐
3. TOPOGRAPHY AND SOILS			
a. Will there be any land/ground disturbance (e.g., excavating, coring, digging, trenching, grubbing, dredging, excavation, or fence installation)? ***Please specify total land disturbance acreage below in "Discussion."***	☑	☐	☐
4. NATURAL RESOURCES			
a. Will the proposal affect undeveloped areas, affect endangered or threatened species or their habitat, occur in areas with known invasive species infestations, or affect plant or animal critical habitat?	☐	☑	☐
b. Will the proposal require removal or trimming of trees? ***Please provide map of tree location below in "Discussion."***	☐	☐	☑
c. Does the project involve soil importing/exporting?	☑	☐	☐
5. CULTURAL RESOURCES			
a. Will the proposed action involve alterations of existing buildings or structures?	☐	☑	☐
b. Will the proposed action be located within or adjacent to a historic district?	☐	☑	☐
c. Will the proposed action involve ground disturbance or occupancy in or near a known archaeological site?	☐	☑	☐
i. If yes/may, will archaeological work be needed? (Permit required)	☐	☐	☐

Attachment E: 01-02-2020 Record of Environmental Consideration

RECORD OF ENVIRONMENTAL CONSIDERATION

ENVIRONMENTAL IMPACT ANALYSIS ***(Any "YES" or "MAY" answers need to be explained in the "Discussion" section at the end of this checklist.)***	**YES**	**NO**	**MAY**
6. LAND USE			
a. Will the proposal result in a change in operations, activities, or land use occurring at the site or facility?	☐	☑	☐
7. NOISE ENVIRONMENT			
a. Will there be any changes to the numbers, types, and operations of aircraft, vehicles, or weapon systems that could affect noise levels?	☐	☑	☐
8. TRAFFIC			
a. Will the proposal generate or increase vehicular traffic?	☐	☑	☐
b. Will there be a requirement to construct, reroute or alter roadways?	☐	☑	☐
9. HAZARDOUS MATERIALS/WASTE OR TOXIC SUBSTANCES			
a. Will the proposal result in the disturbance of lead containing paint or asbestos containing material?	☐	☑	☐
b. Will the proposal result in the use, storage, or disposal of hazardous materials?	☐	☑	☐
c. Will the proposal involve pesticide application (e.g., herbicide or insecticide)?	☐	☑	☐
10. UTILITIES SYSTEMS			
a. Will the proposal require disposal or alterations to existing utility systems or drainage systems (e.g., power, drinking water, waste water, storm water)? ***Please specify type of utility affected in "Discussion."***	☐	☑	☐
11. FLOODPLAIN			
a. Will the proposed action take place within the 100 year floodplain?	☐	☐	☑

Attachment E: 01-02-2020 Record of Environmental Consideration

RECORD OF ENVIRONMENTAL CONSIDERATION

DISCUSSION ***(Annotate items answered "YES" or "MAY" and provide a brief explanation of the potential impacts and mitigation measures to be implemented. Provide answers to the questions of how much, whom, where, when, and how? Contact the DPW Environmental Division at 656-3075 if assistance is needed.)***

Required Discussion: 1a 3a 4b 4c 11a

1a. AIR QUALITY - Dredging operations require use of heavy machinery and vehicles. This may cause suspended air particles common with use of major equipment and vehicles. Contractor will employ mitigating measures (ie dust control, etc) for tenants, if needed.

3a. TOPOGRAPHY AND SOILS - See attached 100% design submittal, will be dredging Kahauiki stream and clearing the mangroves in the silt.

4b. NATURAL RESOURCES - Mangroves in the silt will be removed, some Keawe might need to be trimmed for heavy machinery to gain access to stream.

4c. NATURAL RESOURCES - All silt removed from stream be taken off site.

11a. FLOOD PLAN - See attached 50 year floodplain map.

Potential impacts on the quality of the environment have been considered and are documented within the attached environmental checklist. It has been concluded that this action is not segmented and no extraordinary circumstances exist that would preclude the use of the applicable categorical exclusion identified in paragraph below. This document does not relieve the proponent from compliance with other applicable federal, state and local environmental laws and regulations.

IT HAS BEEN DETERMINED THAT THIS ACTION:

☐ Is adequately covered in the following EA/EIS:

☑ Is categorically excluded under Appendix B, Section II, paragraph (d)(2) of 32 CFR Part 651 for the following reason ***(See 32 CFR Part 651, Environmental Analysis of Army Actions)***:

Routine maintenance of streams and ditches or other rainwater conveyance structures (in accordance with USACE permit authority under Section 404 of the Clean Water Act and applicable state and local permits), and erosion control and stormwater control structures.

Attachment E: 01-02-2020 Record of Environmental Consideration

RECORD OF ENVIRONMENTAL CONSIDERATION

REVIEW AND CONCURRENCES ***(For Environmental Division use)***:

	YES	WITH CMNT	NO	
SMITH.PAUL.FRANCIS.IV.1522911557 Digitally signed by SMITH.PAUL.FRANCIS.IV.1522911557 Date: 2019.07.12 14:09:39 -10'00'	X	X		12 July 19
Natural Resources Program				Date
CROWLEY.DAVID.M.1512306469 Digitally signed by CROWLEY.DAVID.M.1512306469 Date: 2019.12.23 09:19:29 -10'00'	X	X		23 DEC 2019
Cultural Resources Program				Date
NELSON.CARRIE.1008432020 Digitally signed by NELSON.CARRIE.1008432020 Date: 2019.06.26 08:22:12 -10'00'	X			6/26/19
IRP/MMRP Program				Date
EVANS-SHONTOFSKI.MELISSA.LEE.1264771346 Digitally signed by EVANS-SHONTOFSKI.MELISSA.LEE.1264771346 Date: 2019.07.09 08:21:16 -10'00'	X	X		7/9/2019
Clean Water Program				Date
DECAPRIO.KIMBERLY.C.1234587591 Digitally signed by DECAPRIO.KIMBERLY.C.1234587591 Date: 2019.07.01 14:30:45 -10'00'	X	X		7/1/2019
Clean Air/Safe Drinking Water Program				Date
KANEHISA-LAM.DALE.T.1267370296 Digitally signed by KANEHISA-LAM.DALE.T.1267370296 Date: 2019.06.25 08:32:09 -10'00'	X	X		6/25/19
Recycling Program				Date
BRIXIUS.DAVID.KENNETH.1237035719 Digitally signed by BRIXIUS.DAVID.KENNETH.1237035719 Date: 2019.06.25 07:14:06 -10'00'	X			25Jun19
Hazardous Waste Program				Date
MILLER.FREDERICK.J.1271179819 Digitally signed by MILLER.FREDERICK.J.1271179819 Date: 2019.07.10 14:48:39 -10'00'	X			7/10/19
TSCA/SPCC/EPCRA Program				Date
Other ENV Staff as needed				Date

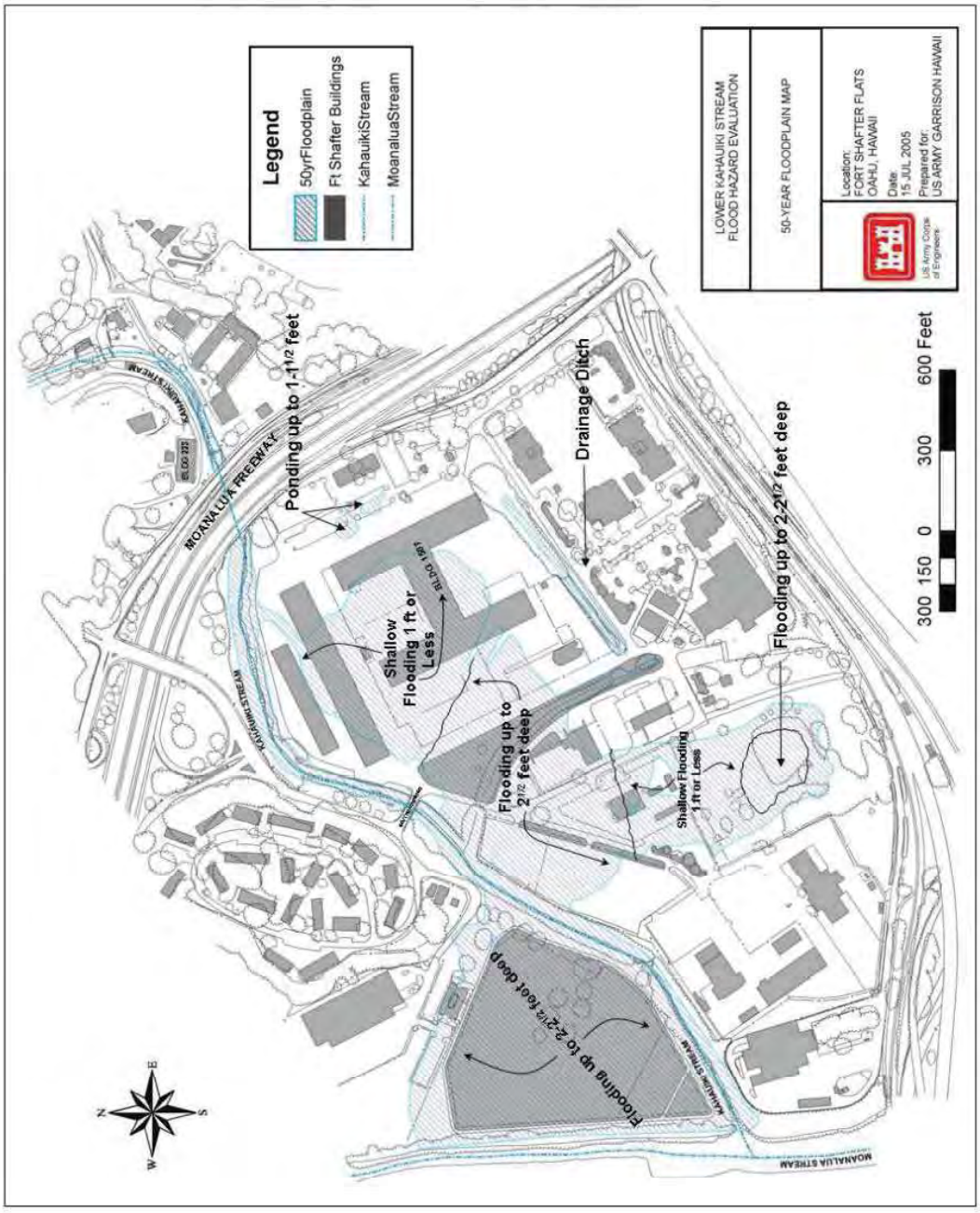
APPROVED BY:

WELSH.D.LYNNE.1499925693 Digitally signed by WELSH.D.LYNNE.1499925693 Date: 2019.12.30 13:12:11 -10'00'

Environmental Coordinator — Date: 12/30/19

☑ ***Concurrence is contingent upon compliance with comments provided.***

Attachment E: 01-02-2020 Record of Environmental Consideration



Attachment E: 01-02-2020 Record of Environmental Consideration

Attachment E: 01-02-2020 Record of Environmental Consideration

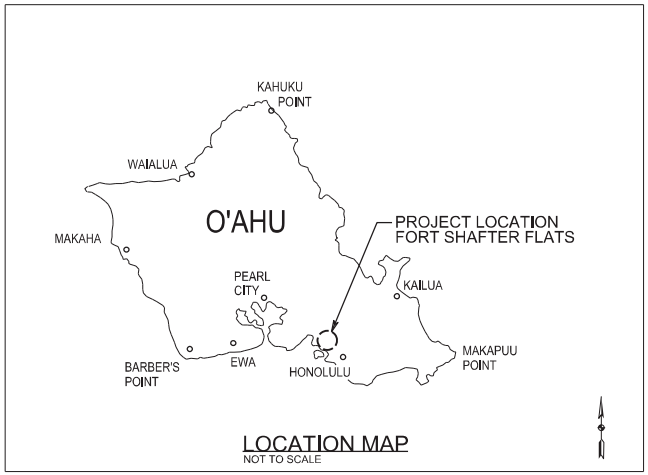
US Army Corps of Engineers®
HONOLULU DISTRICT

FY19 LOWER KAHAUIKI STREAM DREDGING
FORT SHAFTER FLATS, ISLAND OF OAHU

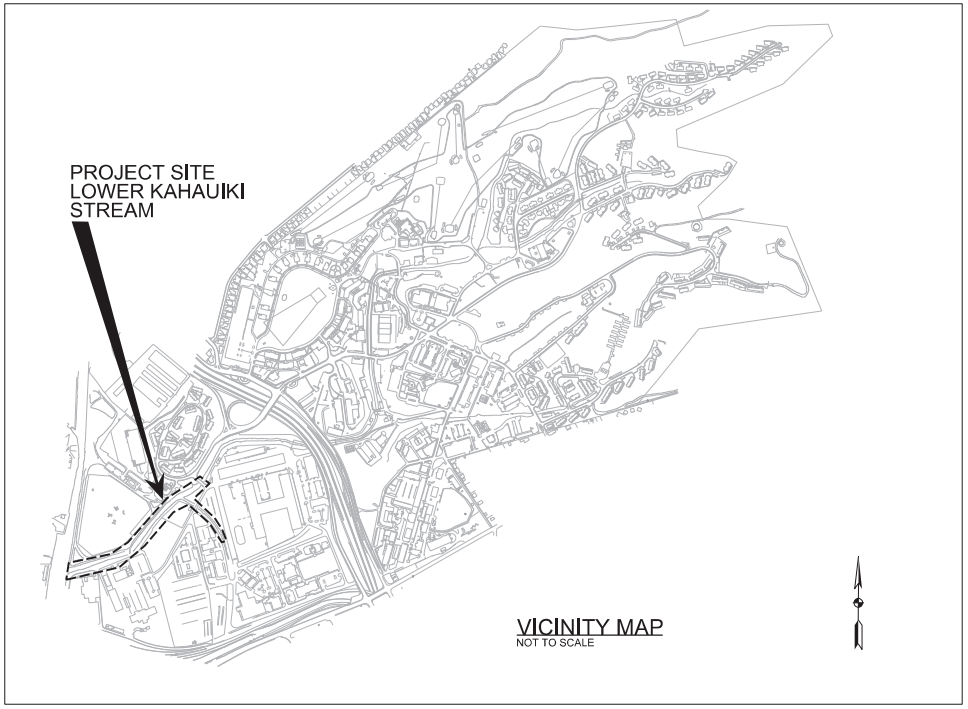
INDEX TO DRAWINGS

DRAWING LIST

SHEET NUMBER	FILE NUMBER	SHEET NAME
		GENERAL
G-001		COVERSHEET & SHEET INDEX
G-002		GENERAL NOTES, SURVEY NOTES, ABREVIATIONS, AND LEGEND
G-003		SITE PLAN - DEWATERING, COSA AND HAUL ROUTE
		CIVIL
C-101		CHANNEL LAYOUT PLAN
C-102		OVERALL SITE PLAN AND SURVEY NOTES
C-103		SURVEY PLAN KAHAUIKI A STA 0+00 - STA 5+50
C-104		SURVEY PLAN KAHAUIKI A STA 5+50 - STA 11+00
C-105		SURVEY PLAN KAHAUIKI A STA 11+00 - STA 18+50
C-106		SURVEY PLAN KAHAUIKI B (TRIBUTARY)STA 0+00 - STA 3+50
C-301		KAHAUIKI A CROSS SECTIONS STA 1+00 - STA 2+50
C-302		KAHAUIKI A CROSS SECTIONS STA 3+00 - STA 4+50
C-303		KAHAUIKI A CROSS SECTIONS STA 5+00 - STA 6+50
C-304		KAHAUIKI A CROSS SECTIONS STA 7+00 - STA 8+50
C-305		KAHAUIKI A CROSS SECTIONS STA 9+00 - STA 10+50
C-306		KAHAUIKI A CROSS SECTIONS STA 11+00 - STA 12+50
C-307		KAHAUIKI A CROSS SECTIONS STA 13+00 - STA 14+50
C-308		KAHAUIKI A CROSS SECTIONS STA 15+00 - STA 16+50
C-309		KAHAUIKI A CROSS SECTIONS STA 17+00 - STA 18+50
C-310		KAHAUIKI B CROSS SECTIONS STA 0+50 - STA 1+65
C-311		KAHAUIKI B CROSS SECTIONS STA 2+15 - STA 3+50



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

This project was designed by the Honolulu District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: (NAME & INITIALS)
DRAWN BY:
CHECKED BY: (NAME & INITIALS)
SUBMITTED BY: (NAME & INITIALS)
SIZE: 24x36 | 11x17 | NUMBER: 9X22

ISSUE DATE: 31/5/19
SOLICITATION NO.:
CONTRACT NO.:
100% SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU - HAWAII

CIVIL WORKS TECHNICAL BRANCH

FY19 LOWER KAHAUIKI STREAM DREDGING PROJECT
FT SHAFTER FLATS, ISLAND OF OAHU

COVER SHEET
LOCATION & VICINITY MAPS, SHEET INDEX

SHEET ID
G-001

Attachment E: 01-02-2020 Record of Environmental Consideration

GENERAL NOTES:

1. THE LOCATIONS OF SILT ON CROSS SECTIONS ARE APPROXIMATE AND FOR ILLUSTRATIVE PURPOSES ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SILT ON CROSS SECTIONS.

2. PRIMARY LANDSIDE ACCESS WILL BE FROM THE WEST BANK DUE TO STEEP SLOPES AND FENCING LIMITING ACCESS ON THE EAST BANK.

3. CONTRACTOR IS RESPONSIBLE FOR CLEARING AND GRUBBING ALL VEGETATION IN DREDGE AREA PRIOR TO DREDGING.

4. ALL SECTIONS OF THE STREAM TO BE DREDGED ARE TIDALLY INFLUENCED AND WILL CONTAIN WATER TO SOME EXTENT AT ALL TIMES.

5. OVERHEAD POWER LINES BETWEEN UTILITY POLES WITH LIGHTS CAN BE POWERED DOWN IF NEEDED. CONTRACTOR MUST COORDINATE ANY POTENTIAL IMPACTS TO UTILITIES WITH THE ARMY DIRECTORATE OF PUBLIC WORKS.

6. HARD MATERIAL, INCLUDING BUT NOT LIMITED TO BOULDERS AND ABANDONED CONCRETE STRUCTURES, SHOULD BE REMOVED TO MEET PROJECT DREDGING DEPTHS AS INDICATED. HARD MATERIAL THAT IS KNOWN IS INDICATED, HOWEVER, CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY MATERIAL THAT MAY BE CONSIDERED TYPICAL OF HAWAII STREAM CONDITIONS.

SURVEY NOTES:

1. HORIZONTAL COORDINATES AND AZIMUTHS ARE REFERENCED TO HAWAII STATE PLANE, ZONE 3, NAD 83 (PA11), EPOCH 2010 U.S. SURVEY FEET. AZIMUTHS ARE MEASURED CLOCKWISE FROM TRUE SOUTH.

2. ELEVATIONS ARE REFERENCED TO SHAFT BOLT, A 3/4 INCH BRASS PIN (PUBLISHED THROUGH NATIONAL GEODETIC SURVEY), ELEVATION=46.50 FEET, MEAN SEA LEVEL, 1983-2001 TIDAL EPOCH, U.S. SURVEY FEET.

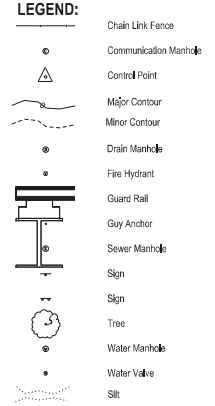
3. FIELD SURVEY WORK HAS BEEN CONDUCTED BY SAM O. HIROTA, INC. ON NOVEMBER 15, 2018 - JANUARY 2, 2019.

4. BATHYMETRY SPOT ELEVATIONS WERE SURVEYED BY USING A FIBERGLASS ATOMIC ROD (BOTTOM OF ROD BEING APPROXIMATELY 2 INCHES IN DIAMETER). THE ATOMIC ROD WAS USED TO LOCATE THE EXISTING GROUND AND SILT IN CERTAIN AREAS. IN THE FIELD, SILT IS DEFINED AS A SOFT UNDERWATER MUD THAT WAS EASILY PENETRATED BY ATOMIC ROD TO LOCATE THE EXISTING GROUND. PLEASE BE ADVISED THAT IT IS POSSIBLE THE SILT MAY HAVE CHANGED FROM TIME OF SURVEY DUE TO RUNOFF FROM HEAVY RAINS .

ABBREVIATIONS:

AC	Asphaltic Concrete
CBMH	Catch Basin Manhole
CLF	Chain Link Fence
COSA	Contractor Operations and Storage Area
CRM	Concrete Rubble Masonry
D=	Diameter
DI	Drain Inlet
E	Easting
ELEV=	Elevation
Exp	Exposed
FH	Fire Hydrant
FT	Feet
GA	Guy Anchor
GP	Guard Post
H=	Height
HH	Hand Hole
Inv=	Invert
MH	Manhole
MSL	Mean Sea Level
N	Northing
POB	Point of Beginning
POE	Point of Ending
PI	Point of Intersection
PT	Point of Tangency
PVC	Polyvinyl Chloride
RCP	Reinforced Concrete Pipe
S=	Spread (Tree Canopy)
SMH	Sewer Manhole
T=	Top
TYP	Typical
UP	Utility Pole
w/	with
WMH	Water Manhole
WV	Water Valve

LEGEND:



ELEVATION DATUMS FROM HONOLULU NOAA TIDE GAUGE FOR THE 1983-2001 TIDAL EPOCH RELATIVE TO MSL = 0.0'

DATUM	VALUE	DESCRIPTION
MHHW	1.08	MEAN HIGHER-HIGH WATER
MHW	0.62	MEAN HIGH WATER
MTL	-0.02	MEAN TIDE LEVEL
MSL	0	MEAN SEA LEVEL
DTL	0.13	MEAN DIURNAL TIDE LEVEL
MLW	-0.66	MEAN LOW WATER
MLLW	-0.82	MEAN LOWER-LOW WATER

GENERAL NOTES, SURVEY NOTES, ABREVIATIONS, AND LEGEND

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: [redacted]
DRAWN BY:
CHECKED BY: THOMAS SHIRAI
SUBMITTED BY: GARRETT K.K. LEE
SIZE: 36X22

ISSUE DATE: 3/18/19
SOLICITATION NO.:
CONTRACT NO.:
100% SUBMITTAL
FILE NUMBER

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU, HAWAII

CIVIL WORKS TECHNICAL BRANCH

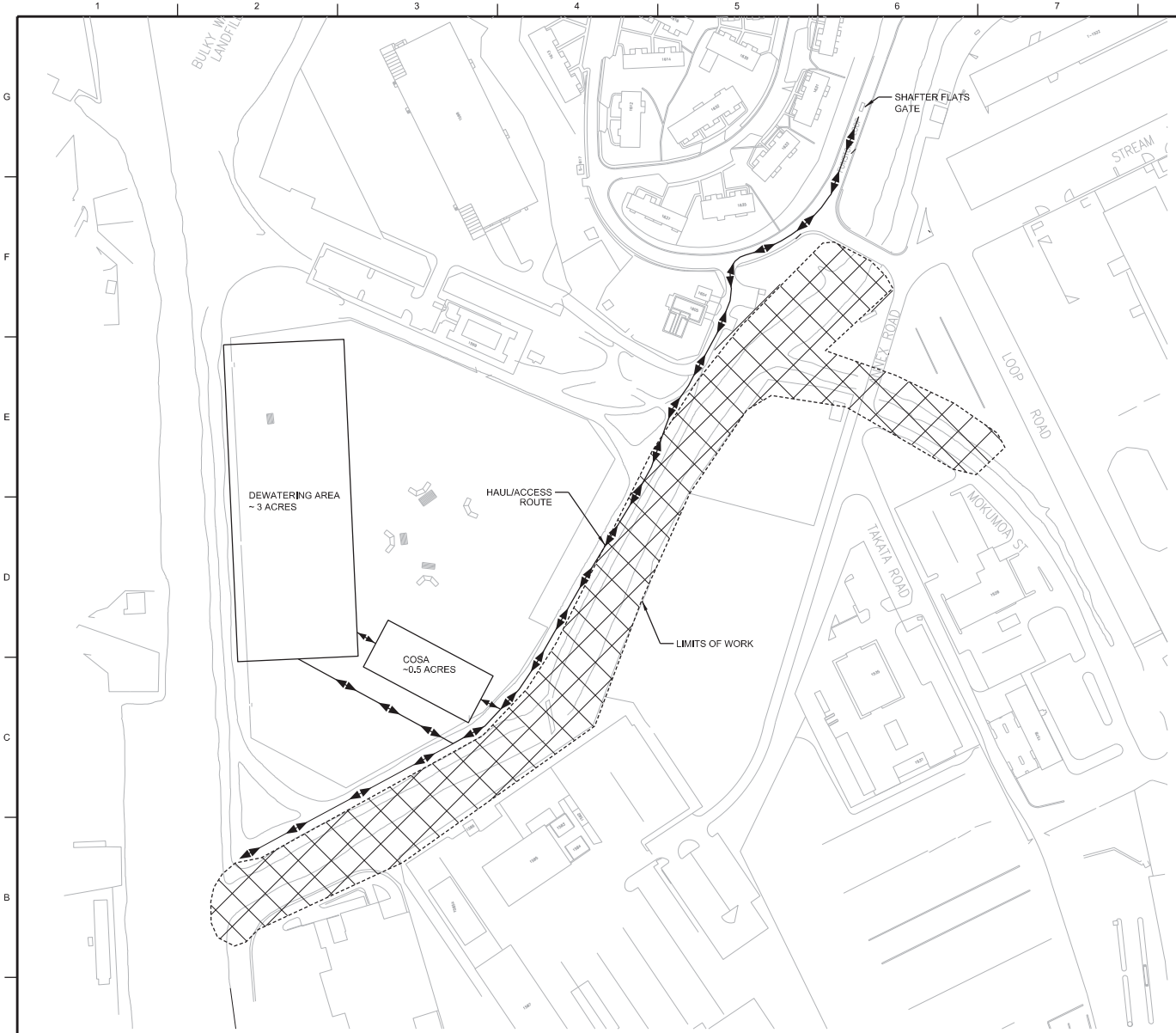
FY19 LOWER KAHAUKI STREAM DREDGING PROJECT
FT SHAFTER FLATS, ISLAND OF OAHU

GENERAL NOTES, SURVEY NOTES, ABREVIATIONS, AND LEGEND

SHEET ID

G-002

Attachment E: 01-02-2020 Record of Environmental Consideration



NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING, CONSTRUCTING AND IMPLEMENTING THE CONTAINMENT SYSTEM TO OFFLOAD, AND LOAD TO TRANSPORT THE DREDGE MATERIAL OF THIS PROJECT THAT WILL ADHERE TO THE APPLICABLE CITY, STATE, AND FEDERAL LAWS.
2. CONTRACTOR MAY BRING IN MATERIAL TO CONSTRUCT A DEWATERING BERM.
3. THE CONTRACTOR'S WORK, STORAGE, AND DEWATERING AREAS AS WELL AS HAUL ROUTES ARE TO BE RESTOED TO PRE-PROJECT CONDITIONS PRIOR TO CONTRACTOR'S DEMOLBILIZATION.
4. NO DREDGING SHALL OCCUR UNDER OR ADJACENT TO BRIDGE STRUCTURES.

SITE PLAN - LIMITS OF WORK, DEWATERING, COSA AND HAUL/ACCESS ROUTE

SCALE: 1"=100'

0 100' 200'

SCALE: 1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:
DRAWN BY:
CHECKED BY:
SUBMITTED BY:
SIZE: 9X22
ISSUE DATE: 3/18/19
SOLICITATION NO.:
CONTRACT NO.:
100% SUBMITTAL
FILE NUMBER

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU - HAWAII

CIVIL WORKS TECHNICAL BRANCH

FY19 LOWER KAHAUKI STREAM DREDGING PROJECT
FT SHAFTER FLATS, ISLAND OF OAHU

SITE PLAN
DEWATERING, COSA AND HAUL/ACCESS ROUTE

SHEET ID

G-003

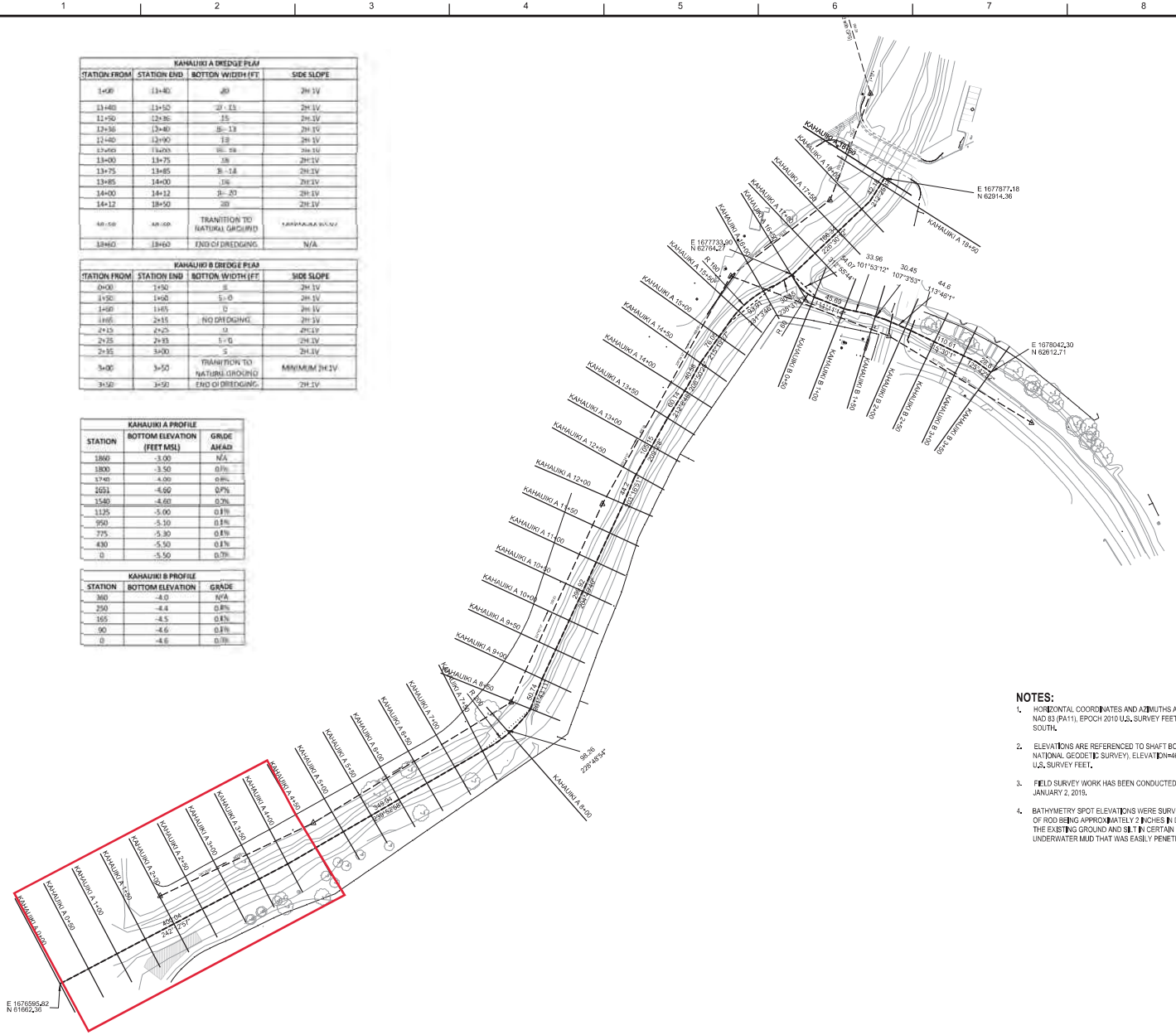
Attachment E: 01-02-2020 Record of Environmental Consideration

KAHAUIKI A DREDGE PLAN			
STATION FROM	STATION END	BOTTOM WIDTH (FT.	SIDE SLOPE
1+00	11+40	40	2H:1V
11+40	11+50	40 - 15	2H:1V
11+50	12+36	25	2H:1V
12+36	13+40	25 - 13	2H:1V
12+40	12+90	13	2H:1V
12+90	13+00	25 - 13	2H:1V
13+00	13+75	25	2H:1V
13+75	13+85	25 - 14	2H:1V
13+85	14+00	25	2H:1V
14+00	14+12	25 - 20	2H:1V
14+12	18+50	20	2H:1V
18+50	18+60	TRANITION TO NATURAL GROUND	MINIMUM 2H:1V
18+60		END OF DREDGING	N/A

KAHAUIKI B DREDGE PLAN			
STATION FROM	STATION END	BOTTOM WIDTH (FT.	SIDE SLOPE
0+00	1+50	15	2H:1V
1+50	1+60	15 - 0	2H:1V
1+60	1+65	0	2H:1V
1+65	2+15	NO DREDGING	2H:1V
2+15	2+25	0	2H:1V
2+25	2+35	0 - 15	2H:1V
2+35	3+00	15	2H:1V
3+00	3+50	TRANITION TO NATURAL GROUND	MINIMUM 2H:1V
3+50		END OF DREDGING	2H:1V

KAHAUIKI A PROFILE		
STATION	BOTTOM ELEVATION (FEET MSL)	GRADE AHEAD
1860	-3.00	N/A
1800	-3.50	0.8%
1740	-4.00	0.8%
1651	-4.60	0.7%
1540	-4.60	0.7%
1125	-5.00	0.1%
950	-5.10	0.1%
775	-5.30	0.1%
430	-5.50	0.1%
0	-5.50	0.0%

KAHAUIKI B PROFILE		
STATION	BOTTOM ELEVATION	GRADE
360	-4.0	N/A
250	-4.4	0.8%
165	-4.5	0.4%
90	-4.6	0.1%
0	-4.6	0.0%



NOTES:

1. HORIZONTAL COORDINATES AND AZIMUTHS ARE REFERENCED TO HAWAII STATE PLANE, ZONE 3, NAD 83 (PA11), EPOCH 2010 U.S. SURVEY FEET. AZIMUTHS ARE MEASURED CLOCKWISE FROM TRUE SOUTH.
2. ELEVATIONS ARE REFERENCED TO SHAFT BOLT, A 3/4 INCH BRASS PIN (PUBLISHED THROUGH NATIONAL GEODETIC SURVEY), ELEVATION=46.50 FEET, MEAN SEA LEVEL, 1983-2001 TIDAL EPOCH, U.S. SURVEY FEET.
3. FIELD SURVEY WORK HAS BEEN CONDUCTED BY SAM O. HIROTA, INC. ON NOVEMBER 15, 2018 - JANUARY 2, 2019.
4. BATHYMETRY SPOT ELEVATIONS WERE SURVEYED BY USING A FIBERGLASS ATOMIC ROD (BOTTOM OF ROD BEING APPROXIMATELY 2 INCHES IN DIAMETER). THE ATOMIC ROD WAS USED TO LOCATE THE EXISTING GROUND AND SILT IN CERTAIN AREAS. IN THE FIELD, SILT IS DEFINED AS A SOFT UNDERWATER MUD THAT WAS EASILY PENETRATED BY ATOMIC ROD TO LOCATE THE EXISTING GROUND.

CHANNEL LAYOUT PLAN

SCALE: 1"=80'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: [redacted]
DRAWN BY: [redacted]
CHECKED BY: THOMAS SHIPPEY
SUBMITTED BY: GARRETT K. [redacted]
SIZE: 9X22
ISSUE DATE: 3/19/19
SOLICITATION NO.:
CONTRACT NO.:
100% SUBMITTAL
I.E.'s NUMBER

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU, HAWAII

CIVIL WORKS TECHNICAL BRANCH

FY19 LOWER KAHAUIKI STREAM DREDGING PROJECT
FT SHAFTER FLATS, ISLAND OF OAHU

CHANNEL LAYOUT PLAN

SHEET ID
C-101

DPW Environmental Program Comments

Concurrence is contingent upon compliance with the following comments.

The following programs have comments:

-Natural Resources Program

-Cultural Resources Program

-Clean Water Program

-Clean Air/Safe Drinking Water Program

-Recycling Program

-EO 11988

-CZMA

IMHW-PWE February 7, 2020

MEMORANDUM FOR RECORD (MFR)

Subject: Agency Determination of No Effect with regards to consultation with the US Fish and Wildlife Service under Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 *et. seq.*), for the Kahauiki Stream Dredge, Fort Shafter Flats, Honolulu, Hawaii.

The US Army Garrison, Hawaii (USAG-HI) is proposing to dredge a portion of the Kahaiki Stream. The proposed activity involves the dredging of the lower portion of the Kahauiki Stream that runs through the Fort Shafter Flats military installation. Additionally, a short portion of an un-named tributary to Kahauiki Stream will be dredged. The project area will include the stream, the stream banks and the adjacent physical training field which will be used as a contractor operations and storage area, and a dewatering area for dredge material. Water present in the stream and tributary appear to be tidally influenced. Dredging of the stream will begin just south of the Funston Loop Bridge and extend southwest 1450 feet towards Moanalua Stream. The southernmost reach of Kahauiki Stream lies upon State DLNR property, therefore the Army plans to dredge this 325 foot final section after a right of entry or easement is obtained from the State DLNR. The areas to be dredged are not concrete lined. The excavated material is expected to consist of plant material, silt, clay, and gravel. Dredging will be performed by either clamshell bucket or excavator operating from the west stream bank. No temporary structures will be placed in the stream during construction. The dredged material will be hauled to an adjacent physical training field, approximately 10 acres in size, for dewatering and temporary storage prior to disposal. A limited sediment evaluation was conducted which indicated it will likely be suitable for landfill disposal.

USAG-HI evaluated the environmental effects of the proposed project to species protected under the Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. 1531 *et. seq.*) and documents in this MFR our agency's determination as to the project's effect on such species and the need to consult with the US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) under Section 7 of the ESA. The project is located within a previously developed area, will not affect endangered or threatened species or their habitat, or affect plant or animal critical habitat. This project is not located in an area with known invasive species infestations.

Based on the above discussion, USAG-HI makes the agency determination that the proposed project would have no effect on federally-listed protected species and therefore formal consultation with the USFWS and NOAA under Section 7 of the ESA is not required [50 CFR 402.12(k)].

SMITH.PAUL.FRANCIS.IV.1522911557 Digitally signed by SMITH.PAUL.FRANCIS.IV.1522911557 Date: 2020.02.07 10:08:53 -10'00'

PAUL F. SMITH
Biologist

Attachment E: 01-02-2020 Record of Environmental Consideration

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service recommends that the measures below be incorporated into projects to minimize the degradation of water quality and minimize the impacts to fish and wildlife resources.

1. Turbidity and siltation from project-related work shall be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

2. Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.

3. Dredging and filling in the marine/aquatic environment shall be designed to avoid or minimize the loss special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the function of such habitat shall be replaced.

4. All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.

5. No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.

6. All debris removed from the marine/aquatic environment shall be disposed of at an approved upland or ocean dumping site.

7. No contamination (trash or debris disposal, non-native species introduction, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities. This shall be accomplished by implementing a litter-control plan and developing a Hazard Analysis and Critical Control Point Plan (HACCP – see http://www.haccp-nrm.org/Wizard/default.asp) to prevent attraction and introduction of non-native species.

8. Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases.

9. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

10. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

IMHW-PWE 31 December 2019

MEMORANDUM FOR

USAG-HI, DPW, ENVIRONMENTAL DIVISION NEPA PROGRAM (IMHW-PWE)
USAG-HI, DPW, ENGINEERING DIVISION (IMHW-PWF)

SUBJECT: REC # 4559 / Project # CRS-19-103: Kahuaiki Stream Dredging and Maintenance, Fort Shafter, Kahauiki Ahupua'a, Honolulu District, Island of O'ahu, State of Hawai'i.

Directorate of Public Works (DPW), Cultural Resources Section has completed Section 106 consultation for the Kahauiki Stream dredging project at Fort Shafter Flats (REC 4559). U.S. Army Garrison Hawaii (USAG-HI) identified historic properties beneath and in the project area. To avoid any impacts to cultural resources, dredging and vegetation removal will only remove built-up sediments and debris with no additional ground disturbance beneath the constructed canal. The DPW Engineering Division will ensure that the project implements a 3 foot buffer to avoid disturbing the mortar and the stacked basalt wall on the western bank of the canal. DPW Engineering may place other safeguards such as markers to aid in avoidance.

Encl

PAMERLEAU-WALDEN.JACQUELINE.ANNE.1081444508

Digitally signed by PAMERLEAU-WALDEN.JACQUELINE.ANNE.1081444508
Date: 2019.12.31 12:11:13 -10'00'

Attachment E: 01-02-2020 Record of Environmental Consideration

Clean Water Program Comments:

REC #: (4559) Kahauiki Stream Dredging

Reviewed by: Melissa Evans-Shontofski DATE: 9 July 2019

- **Spill response kits MUST be available for use ON-SITE during ALL periods of activity when a potential exists for fuel, oil, or chemical release (leak/spill). Workers on-site must be knowledgeable concerning spill response procedures.**
- **Implement sediment and erosion control Best Management Practices (BMPs) consistent with the City and County of Honolulu's Best Management Practices Manual for Construction Sites in Honolulu throughout the duration of construction activities to prevent sediment and construction debris from entering the storm sewer system.**
- **Kahauiki Stream is considered Jurisdictional under the Clean Water Act. Please consult with US Army Corps of Engineers Regulatory to determine appropriate permits required. Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act may apply.**
- **This project may also qualify for the Stream Channel Alteration Permit (SCAP) permit from Department of Land and Natural Resources (DLNR). Please consult with DLNR to determine if permit is necessary.**
- **Projects that result in the disturbance of one acre or more of total land (including COSA/lay down areas) area must obtain a National Pollutant Discharge Elimination System (NPDES) permit through the Hawaii Department of Health (DOH), Clean Water Branch. Coverage may be applied for under the Notice of General Permit Coverage (NGPC) from DOH. A Notice of Intent (NOI) must be filed with DOH for permit coverage. Please refer to Hawaii Administrative Rule (HAR) 11-55 Appendix C for more information.**
- **This project is eligible for BMP inspection(s) performed by DPW ENV to ensure that the Garrison's Construction Site Runoff Control policy and requirements under the Garrison's Municipal Separate Storm Sewer System permit (HIS000090) are adhered to (see attached policy). Storm water training slides are available from DPW Environmental.**

Please contact a member of the Clean Water Program Team if you have

questions or concerns:

Melissa: Melissa.l.evans-shontofski.civ@mail.mil- 808-656-7001

CLEAN AIR/SAFE DRINKING WATER PROGRAM COMMENTS

Date: 06/27/2019

FS_Kahauiki Stream Dredging (4559)

1. Take reasonable precautions to minimize fugitive dust generated from construction activities. Please see Hawaii Administrative Rules 11-60.1-33, “Fugitive Dust” for a description of reasonable precautions: http://health.hawaii.gov/cab/files/2014/07/HAR_11-60_1-typed.pdf.

Please direct any requested information and questions to:
Kim DeCaprio, kimberly.c.decaprio.civ@mail.mil, 656-3107
Dustin Phommanivong, dustin.c.phommanivong.civ@mail.mil, 656-3316

Attachment E: 01-02-2020 Record of Environmental Consideration

Record of Environmental Consideration for Kahauiki Stream Dredging, Fort Shafter (RB000857J)

Recycling Program Comments (POC: Dale Kanehisa, 656-5411 or dale.t.kanehisa.civ@mail.mil):

Army goal is to achieve at least 60% of construction and demolition material recycling. The project planning shall incorporate recycling and reuse measures to reduce the amount of construction and demolition waste requiring landfill disposal or incineration. This includes cardboard, scrap metal, concrete, asphalt, excess soil and greenwaste, which should be taken to an appropriate recycling or reuse facility. At the close of the project copies of weight tickets must be reported to the Army Recycle Program, as well as a summary of the amount of materials that were recycled and disposed of. See attached diversion form as an example.

To submit the requested information, or for additional guidance please contact Dale Kanehisa 656-5411 or dale.t.kanehisa.civ@mail.mil

Attachment E: 01-02-2020 Record of Environmental Consideration

Attachment E: 01-02-2020 Record of Environmental Consideration

Email this form and corresponding weight receipts to: dale.t.kanehisa.civ@mail.mil
ATTN: Solid Waste/Recycling Program, DPW Environmental

Revised 8/1/2013

Summary of Solid Waste Disposal and Diversion

Negative Response Required

Project Title: _____
Project #: _____

Type of Material	Name of Disposal Facility	(a) Recycled (tons)	(b) Class III Landfill Disposal (tons)	(c) Reused (tons)	
Asphalt					
Concrete					
Dirt					
Metals					
Wood Waste					
Green Waste					
Corrugated Cardboard					
Deconstruction					Total % Diversion: (a+c)/(a+b+c) x 100
Other: _____					
Total (tons)					

1. Were deconstruction options considered for this project as outlined in PWTB 200-1-23? YES / NO
If not, please provide justification:

_____

_____

2. Was 50% of the material diverted from the landfill per EO 13514 and Army Regulation 420-1? YES / NO
If not, please provide justification:

_____

_____

Name of company: _____ Contact Phone #: _____
Person completing form: _____ Signature: _____
Period covered: From: Alton Exzabe To: Steve Lai

IMHW-PWE 9 October 2019

MEMORANDUM FOR RECORD

SUBJECT: Executive Order 11988 Compliance for the Kahauiki Stream Dredging and Maintenance Project, Fort Shafter Flats, Honolulu District, O‘ahu, Hawai‘i.

1. The U.S. Army Garrison, Hawaii’s (USAG-HI) Directorate of Public Works (DPW), National Environmental Policy Act (NEPA) program conducted an environmental analysis of a proposed project, which entails maintenance dredging of the lower Kahauiki stream at Fort Shafter Flats. The project is needed to reduce the risk of flooding to the surrounding area, which is located in a floodplain. A part of the analysis required compliance with Executive Order (EO) 11988.

2. EO 11988 establishes a national objective to avoid, to the extent possible, long-and short-term adverse impacts associated with the occupancy and modification of the base floodplain and the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative. Accordingly, USAG-HI is required to formulate projects which, to the extent possible, avoid or minimize adverse impacts associated with use of the base floodplain and avoid inducing development in the base flood plain unless there is no practicable alternative.

3. The proposed project is a maintenance activity which will remove silt and debris within the stream banks to the existing depth of the stream. Since the project is a maintenance activity, it does not constitute as an improvement and is not subject to the policies of EO 11988. Dredge and removal of silt and debris will result in flood risk reduction to the surrounding Fort Shafter Flats and areas down-stream.

4. For these reasons, the maintenance dredging of the Kahauiki stream within floodplain is the only practicable alternative and would not indirectly induce further development in the floodplain. Based on the preceding discussion, the USAG-HI asserts that although EO 11988 does not apply to the proposed maintenance activity, the tentatively selected plan has been reviewed for compliance with the intent of EO 11988.

5. Point of contact regarding this memorandum is Mr. Alton Exzabe, NEPA Coordinator in the DPW Environmental Division. He can be reached at (808) 656-1340 or email at alton.j.exzabe.civ@mail.mil.

WAHL.GREGORY.T.1391439954
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Date: 2019.11.01 15:12:26 -10'00'

Greg T. Wahl
NEPA Program Manager

Attachment E: 01-02-2020 Record of Environmental Consideration

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

JAN 27 2020

SUBJECT: Coastal Zone Management Act (CZMA) Negative Determination Letter at the Kahauiki Stream, Fort Shafter Flats, Oahu, State of Hawaii, Portions of TMK 1-1-006:001, 1-1-006:004, 1-1-008:001, 1-1-008:002, 1-1-035:001, 1-1-035:002, and 1-1-006:013

Mr. Leo R. Asuncion
Office of Planning, State of Hawaii
Coastal Zone Management Program
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Asuncion

In accordance with the Coastal Zone Management Act of 1972 (CZMA) as amended, Section 307C(1), the Department of the Army (Army) has determined that the dredging of the lower portion of the Kahauiki Stream will not affect the coastal uses or resources of Hawaii. Therefore, a consistency determination is not required.

The proposed activity involves the maintenance dredging of the lower portion of the Kahauiki Stream that runs through the Fort Shafter Flats military installation. Approximately 1750 feet of the stream and 350 feet of an un-named tributary will be dredged. Dredging of the stream will begin just south of the Funston Loop Bridge and end at the Moanalua Stream. Around 350 feet of the proposed dredge area, nearest to Moanalua Stream, is owned by the State of Hawaii Department of Land and Natural Resources (DLNR). Work in this area will be completed by the Army, after receipt of either an easement or right of entry from the DLNR. The excavated material is expected to consist of silt, clay, gravel, and plant material. Dredging will be performed by excavating equipment operating from the stream bank. The dredged material will be hauled to an adjacent physical training field for dewatering and temporary storage, prior to disposal. The field is located on the Fort Shafter Flats.

Fort Shafter Flats is located within the southern portion of Fort Shafter, below Moanalua Freeway, in an area known as Mapunapuna. Fort Shafter Flats is bounded by Moanalua Freeway to the north, Middle Street to the southeast, Nimitz Highway to the south and Moanalua Stream to the west. The project area is located primarily within Fort Shafter Flats, with a shorter section of the project falling within State owned land.

Attachment E: 01-02-2020 Record of Environmental Consideration

The Army recognizes that dredging actions may affect land, water, and natural resources within the coastal zone and therefore are subject to the provisions of the CZMA. Consequently, a coastal zone analysis of the impacts of the proposed action presented the following findings:

1. **Land use Compatibility** - The proposed action will not adversely affect the land uses because there will be no change in operations, activities, or land use of the site.

2. **Traffic** - The proposed action will not adversely affect traffic because the project will not generate or increase vehicular traffic; nor will there be a requirement to construct, reroute or alter roadways.

3. **Noise** - Other than temporary, daytime ambient noise from construction activities, the proposed action will not adversely affect current noise levels.

4. **Topography and Soils** - Dredging of the stream will not adversely affect land based topography and soils in the long term. The stockpiling and dewatering of the dredged material will temporarily change the topography of the adjacent training field. The surface of the field will be returned to its previous condition after disposal of the dredged material.

5. **Air Quality** - The proposed action will not adversely affect air quality beyond temporary fugitive dust and fossil fuel emissions during the actual construction.

6. **Biological Resources** - The proposed action will not affect undeveloped areas; endangered or threatened species or their habitat.

7. **Cultural Resources** - The Army has found that no historic properties will be affected by the proposed action. Section 106 consultation under the National Historic Preservation Act has been completed.

8. **Water Resources** - The proposed action will not adversely affect water resources. Approvals through the Corps Regulatory Branch and the State Department of Health Clean Water Branch are anticipated to be obtained. These approvals require Best Management Practice implementation for both in-water work and land based construction activities.

9. **Infrastructure and Utilities Systems** - The proposed action will not adversely affect public infrastructure and utilities. Project is expected to improve drainage capacity of the stream and lower the chances of flooding in the Fort Shafter Flats area.

10. **Visual Resources** - The proposed action will not adversely affect visual resources. The surrounding areas are commercial and industrial activities with no known visual landmarks.

11. **Toxic and Hazardous Substances -** The proposed action will not cause an adverse effect due to toxic and hazardous substances. Any potentially hazardous materials would be stored using best management practices and disposed of in accordance with all applicable regulations.

Based on the information summarized above, the Army has determined that the maintenance dredging of the lower part of the Kahauiki Stream would not negatively affect coastal uses or resources of Hawaii. If you need additional information about this negative determination, please contact Greg Wahl, National Environmental Policy Act Program Manager, Directorate of Public Works, Environmental Division at gregory.t.wahl.civ@mail.mil.

Sincerely,

Kent K. Watase, PE
Director of Public Works

Enclosure

Attachment E: 01-02-2020 Record of Environmental Consideration

Print Form | Save As

U.S. Army Corps of Engineers (USACE)

NATIONWIDE PERMIT PRE-CONSTRUCTION NOTIFICATION (PCN)

For use of this form, see 33 CFR 330; the proponent agency is CECW-COR.

Form Approved - OMB No. 0710-0003 Expires: 2027-10-31

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Program of the Corps of Engineers (Corps); Final Rule 33 CFR 320-332.

Principal Purpose Information provided on this form will be used in evaluating the nationwide permit pre-construction notification.

Routine Uses This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of the agency coordination process.

Disclosure Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

The public reporting burden for this collection of information, 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at . Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR RESPONSE TO THE ABOVE EMAIL.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (*see sample drawings and/or instructions*) and be submitted to the district engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
POH-2025-00040			

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (*agent is not required*)
First - Nisit Middle - A Last - Gainey	First - William Middle - F Last - Bow
Company - U.S. Army Garrison Hawaii	Company - Kahewai Environmental LLC
Company Title - Director of Public Works	E-mail Address - wbow@kahewai.com
E-mail Address - nisit.a.gainey.civ@army.mil	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
Address- 7 Wright Avenue, Wheeler Army Airfield	Address- 2855 E. Manoa Road, Ste. 105, #316
City - Wahiawa State - HI ZIP - 96857 Country - USA	City - Honolulu State - HI ZIP - 96822 Country - USA
7. APPLICANT'S PHONE NOs. with AREA CODE	**10. AGENT'S PHONE NOs. with AREA CODE**
a. Residence b. Business c. Fax d. Mobile	a. Residence b. Business 808-371-0676 c. Fax d. Mobile

STATEMENT OF AUTHORIZATION

11. I hereby authorize, William F. Bow to act in my behalf as my agent in the processing of this nationwide permit pre-construction notification and to furnish, upon request, supplemental information in support of this nationwide permit pre-construction notification.

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME or TITLE (*see instructions*)

Kahauiki Stream Maintenance Dredging, Phase 2 (Kahauiki B)

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

Print Form | Save As

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

13. NAME OF WATERBODY, IF KNOWN (*if applicable*)
Kahauiki Stream

14. PROPOSED ACTIVITY STREET ADDRESS (*if applicable*)
Annex Road (Lower Ft. Shafter)

15. LOCATION OF PROPOSED ACTIVITY (*see instructions*)

Latitude	°N	Longitude	°W
21.3393144919	N	157.889874683	W

City: Honolulu | State: HI | ZIP: 96819

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (*see instructions*)

State Tax Parcel ID: 1-1-008:001

Municipality:

Section:

Township:

Range:

17. DIRECTIONS TO THE SITE
From Daniel K. Inouye International Airport, take Aolele Street to Puuloa Road (1.5 miles). Take a left turn onto Puuloa Road and take the N. King Street/Moanalua Road exit toward Ft. Shafter to Funston Road (1.7 miles). Continue on Funston Road south, then turn left onto Funston Loop (0.1 miles). Turn right onto Annex Road. Kahauiki Stream B and the culvert runs perpendicular (and under) Annex Road.

18. IDENTIFY THE SPECIFIC NATIONWIDE PERMIT(S) YOU PROPOSE TO USE
Nationwide Permit 3

19. DESCRIPTION OF PROPOSED NATIONWIDE PERMIT ACTIVITY (*see instructions*)
Portions of Kahauiki Stream (Lower Ft. Shafter, Oahu, Hawaii), labeled "Kahauiki B" in the attached "Fort Shafter Flats Installation, Island of Oahu, Hawaii, Kahauiki Stream Maintenance Dredging, Phase 2" plans (dated September 5, 2024) require interior culvert clearing of two (2), 36-inch diameter reinforced concrete drainage pipes located at station 1+63.80. Sediment will be cleared from the pipes' interior and dredging of the surrounding areas (Station 0+50 to 3+00) is recommended. Approximately 183 CY of sediment are planned to be removed from the 4,476 SF area within Kahauiki B. The stream slopes will be graded to a 2:1 slope. A structural engineer will inspect the culvert's structural integrity after the culvert has been cleared. This will help to assess if any additional maintenance/repair is needed within the culvert. If the culverts need to be replaced, then approximately 13 CY of net fill (230 CY excavation, 243 CY fill) will be used in the 1,754 SF of disturbed area. The discharge of fill material in this area includes two new 36-inch RCP drain pipes, non-woven filter fabric, trench aggregate, rock and gravel, CSLM, and AC aggregate and pavement to match the existing finished grades.

20. DESCRIPTION OF PROPOSED MITIGATION MEASURES (*see instructions*)
In-water BMPs will be used. Turbidity curtains, anchor ballasts, and booms may be used to contain sediment during operations and minimize the spread of sediment to other areas of the stream and surrounding waters. These BMPS are temporary discharges and will be removed after construction activities are completed. Dredged material will not be discharged or placed back into the stream. Dredged sediment will be removed from areas of Kahauiki Stream "B" including from within blocked drainage pipes. If the culverts need to be replaced, then no expanded area into the stream is expected to complete this work. Additionally, prior to starting work in the stream, visual observations of the site will be performed to ensure no birds or other wildlife are present or will be disturbed by the activities.

21. PURPOSE OF NATIONWIDE PERMIT ACTIVITY (*Describe the reason or purpose of the project, see instructions*)
Kahauiki Stream is prone to flooding with historical records of flood events. The principal cause of flooding of the lower reaches of Kalihi and Moanalua Streams are the restricted capacities of the numerous bridges at the mouths of the streams. In an attempt to mitigate flood events, dredging efforts in Kahauiki Stream were initiated in 2020, but were not completed due to a number of differing site conditions and permitting complications. In order to create a fully functioning stream system passing under Annex Road (Kahauiki B), unblocking and potential repair/replacement the two (2) existing 36-inch reinforced concrete drainage pipes is recommended. The proposed start date of dredging and construction is July 2025 with completion by December 2025.

22. QUANTITY OF WETLANDS, STREAMS, OR OTHER TYPES OF WATERS DIRECTLY AFFECTED BY PROPOSED NATIONWIDE PERMIT ACTIVITY (*see instructions*)

Acres	Linear Feet	Cubic Yards Dredged or Discharged
0.040	40	183 CY (Dredged), 13 CY (Net Fill)

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site.

23. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. (*see instructions*)
Dredging of other portions of the stream are being applied for under a separate permit application (POH-2017-0079) as a Letter of Permission.

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

Print Form | Save As

24. If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and/or the loss of greater than 3/100-acre of stream bed and requires pre-construction notification, explain how the compensatory mitigation requirement in paragraph (c) and/or paragraph (d) of general condition 23 will be satisfied, or explain why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required for the proposed activity.

Not applicable. The project area is less than 0.1 acres.

25. Is any portion of the nationwide permit activity already complete? ☐ Yes ☑ No If Yes, describe the completed work:

26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. (*see instructions*)

There are no critical habitats listed for in the project area. The following species are listed as endangered in the USFWS Information for Planning and Consultation for the project area: Hawaiian Hoary Bat (Lasiurus cinereus semotus), Band-rumped Storm-petrel (Hydrobates castro), Hawaiian Common Gallinule (Gallinula galeata sandvicensis), Hawaiian Coot (alae Ke`oke`o, Fulica ala), Hawaiian Duck (Anas wyvilliana), Hawaiian Petrel (Pterodroma sandwichensis), Hawaiian Stilt (Himantopus mexicanus knudseni), Newell's Shearwater (Puffinus newelli), Hawksbill Sea Turtle (Eretmochelys imbricata), `akoko (Euphorbia celastroides var. kaenana), `ena`ena (Pseudognaphalium sandwicensium var. molokaiense), Carter's Panicgrass (Panicum fauriei var. carteri), Ihi (Portulaca villosa), Ohai (Sesbania tomentosa). These species are unlikely to be affected by the project activities due to all the work being performed in the water or on existing structures; no impacts to flora or fauna are expected. Please see the Memo (dated January 02, 2020) for the Record of Environmental Consideration for the project for additional details.

27. List any historic properties that have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic property or properties. (*see instructions*)

The proposed action does not involve disturbance of any known or documented archaeological sites. Please see the Memo (dated January 02, 2020) for the Record of Environmental Consideration for the project for additional details.

28. For a proposed NWP activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, identify the Wild and Scenic River or the "study river":

Not applicable.

29. If the proposed NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, have you submitted a written request for section 408 permission from the Corps district having jurisdiction over that project? ☐ Yes ☑ No

If "yes", please provide the date your request was submitted to the Corps district:

30. If the terms of the NWP(s) you want to use require additional information to be included in the PCN, please include that information in this space or provide it on an additional sheet of paper marked Block 30. (*see instructions*)

Attached to this PCN are two documents to reference for the project and related activities:
1. Construction drawings: "Fort Shafter Flats Installation, Island of Oahu, Hawaii, Kahauiki Stream Maintenance Dredging, Phase 2" plans (dated September 5, 2024)
2. Memo (dated January 02, 2020) for the Record of Environmental Consideration for the project.

31. Pre-construction notification is hereby made for one or more nationwide permit(s) to authorize the work described in this notification. I certify that the information in this pre-construction notification is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

The pre-construction notification must be signed by the person who desires to undertake the proposed activity (applicant) and, if the statement in Block 11 has been filled out and signed, the authorized agent.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

Print Form Save As

Instructions for Preparing a
Department of the Army
Nationwide Permit (NWP) Pre-Construction Notification (PCN)

Blocks 1 through 4. To be completed by the Corps of Engineers.

Block 5. Applicant's Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the preconstruction notification, please attach a sheet of paper with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the PCN. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant's Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where he / she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by the applicant, if an agent is to be employed.

Block 12. Proposed Nationwide Permit Activity Name or Title. Please provide a name identifying the proposed NWP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 13. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the NWP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Activity Street Address. If the proposed NWP activity is located at a site having a street address (not a box number), please enter it in Block 14.

Block 15. Location of Proposed Activity. Enter the latitude and longitude of where the proposed NWP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area requiring evaluation. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality where the site is located.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide a description of the location of the proposed NWP activity, such as lot numbers, tract numbers, or you may choose to locate the proposed NWP activity site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed NWP activity site if known. If there are multiple locations, please indicate directions to each location on a separate sheet of paper and mark as Block 17.

Block 18. Identify the Specific Nationwide Permit(s) You Propose to Use. List the number(s) of the Nationwide Permit(s) you want to use to authorize the proposed activity (e.g., NWP 29).

Block 19. Description of the Proposed Nationwide Permit Activity. Describe the proposed NWP activity, including the direct and indirect adverse environmental effects the activity would cause. The description of the proposed activity should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal. Identify the materials to be used in construction, as well as the methods by which the work is to be done.

Provide sketches when necessary to show that the proposed NWP activity complies with the terms of the applicable NWP(s). Sketches usually clarify the activity and result in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed NWP activity (e.g.,a conceptual plan), but do not need to be detailed engineering plans.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 19.

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

Block 20. Description of Proposed Mitigation Measures. Describe any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed NWP activity. The description of any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or additional mitigation measures.

Block 21. Purpose of Nationwide Permit Activity. Describe the purpose and need for the proposed NWP activity. What will it be used for and why? Also include a brief description of any related activities associated with the proposed project. Provide the approximate dates you plan to begin and complete all work.

Block 22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by the Proposed Nationwide Permit Activity. For discharges of dredged or fill material into waters of the United States, provide the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained by the proposed NWP activity. For structures or work in navigable waters of the United States subject to Section 10 of the Rivers and Harbors Act of 1899, provide the amount of navigable waters filled, dredged, or occupied by one or more structures (e.g., aids to navigation, mooring buoys) by the proposed NWP activity.

For multiple NWPs, or for separate and distant crossings of waters of the United States authorized by NWPs 12 or 14, attach an extra sheet of paper marked Block 21 to provide the quantities of wetlands, streams, or other types of waters filled, flooded, excavated, or drained (or dredged or occupied by structures, if in waters subject to Section 10 of the Rivers and Harbors Act of 1899) for each NWP. For NWPs 12 and 14, include the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained for each separate and distant crossing of waters or wetlands. If more space is needed, attach an extra sheet of paper marked Block 22.

Block 23. Identify Any Other Nationwide Permit(s), Regional General Permit(s), or Individual Permit(s) Used to Authorize Any Part of Proposed Activity or Any Related Activity. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. For linear projects, list other separate and distant crossings of waters and wetlands authorized by NWPs 12 or 14 that do not require PCNs. If more space is needed, attach an extra sheet of paper marked Block 23.

Block 24. Compensatory Mitigation Statement for Losses of Greater Than 1/10-Acre of Wetlands and/or of Greater Than 3/100-Acre of Stream Bed When Pre-Construction Notification is Required. Paragraphs (c) and (d) of NWP general condition 23 require compensatory mitigation at a minimum one-for-one replacement ratio for all wetland losses that exceed 1/10-acre and/or for all losses of stream bed that exceed 3/100-acre, unless the district engineer determines in writing that either some other form of mitigation is more environmentally appropriate or the adverse environmental effects of the proposed NWP activity are no more than minimal without compensatory mitigation, and provides an activity-specific waiver of this requirement. Describe the proposed compensatory mitigation for wetland losses greater than 1/10 acre and/or for losses of stream bed that exceed 3/100-acre, or provide an explanation of why the district engineer should not require wetland and/or stream compensatory mitigation for the proposed NWP activity. If more space is needed, attach an extra sheet of paper marked Block 24.

Block 25. Is Any Portion of the Nationwide Permit Activity Already Complete? Describe any work that has already been completed for the NWP activity.

Block 26. List the Name(s) of Any Species Listed As Endangered or Threatened under the Endangered Species Act that Might be Affected by the Nationwide Permit Activity. If you are not a federal agency, and if any listed species or designated critical habitat might be affected or is in the vicinity of the proposed NWP activity, or if the proposed NWP activity is located in designated critical habitat, list the name(s) of those endangered or threatened species that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 7 of the Endangered Species Act.

Block 27. List Any Historic Properties that Have the Potential to be Affected by the Nationwide Permit Activity. If you are not a Federal agency, and if any historic properties have the potential to be affected by the proposed NWP activity, list the name(s) of those historic properties that have the potential to be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

Block 28. List the Wild and Scenic River or Congressionally Designated Study River if the Nationwide Permit Activity Would Occur in such a River. If the proposed NWP activity will occur in a river in the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" under the Wild and Scenic Rivers Act, provide the name of the river. For a list of Wild and Scenic Rivers and study rivers, please visit .

Block 29. Nationwide Permit Activities that also Require Permission from the Corps Under 33 U.S.C. 408. If the proposed NWP activity also requires permission from the Corps under 33 U.S.C. 408 because it will temporarily or permanently alter, occupy, or use a Corps federal authorized civil works project, indicate whether you have submitted a written request for section 408 permission from the Corps district having jurisdiction over that project.

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

Block 30. Other Information Required For Nationwide Permit Pre-Construction Notifications. The terms of some of the Nationwide Permits include additional information requirements for preconstruction notifications:

* NWP 3, Maintenance –information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals.
* NWP 31, Maintenance of Existing Flood Control Facilities –a description of the maintenance baseline and the dredged material disposal site.
* NWP 33, Temporary Construction, Access, and Dewatering –a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions.
* NWP 44, Mining Activities –if reclamation is required by other statutes, then a copy of the final reclamation plan must be submitted with the pre-construction notification.
* NWP 45, Repair of Uplands Damaged by Discrete Events –documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration.
* NWP 48, Commercial Shellfish Aquaculture Activities –(1) a map showing the boundaries of the project area, with latitude and longitude coordinates for each corner of the project area; (2) the name(s) of the species that will be cultivated during the period this NWP is in effect; (3) whether canopy predator nets will be used; (4) whether suspended cultivation techniques will be used; and (5) general water depths in the project area (a detailed survey is not required).
* NWP 49, Coal Remining Activities –a document describing how the overall mining plan will result in a net increase in aquatic resource functions must be submitted to the district engineer and receive written authorization prior to commencing the activity.
* NWP 50, Underground Coal Mining Activities –if reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification.

If more space is needed, attach an extra sheet of paper marked Block 30.

Block 31. Signature of Applicant or Agent. The PCN must be signed by the person proposing to undertake the NWP activity, and if applicable, the authorized party (agent) that prepared the PCN. The signature of the person proposing to undertake the NWP activity shall be an affirmation that the party submitting the PCN possesses the requisite property rights to undertake the NWP activity (including compliance with special conditions, mitigation, etc.).

DELINEATION OF WETLANDS, OTHER SPECIAL AQUATIC SITES, AND OTHER WATERS

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. The 45 day PCN review period will not start until the delineation is submitted or has been completed by the Corps.

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross-Section Map. Identify each illustration with a figure or attachment number. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings should also be included. Please submit one original, or good quality copy, of all drawings on 8½x11 inch plain white paper (electronic media may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross-section). While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.

ADDITIONAL INFORMATION AND REQUIREMENTS

For proposed NWP activities that involve discharges into waters of the United States, water quality certification from the State, Tribe, or EPA must be obtained or waived (see NWP general condition 25). Some States, Tribes, or EPA have issued water quality certification for one or more NWPs. Please check the appropriate Corps district web site to see if water quality certification has already been issued for the NWP(s) you wish to use. For proposed NWP activities in coastal states, state Coastal Zone Management Act consistency concurrence must be obtained, or a presumption of concurrence must occur (see NWP general condition 26). Some States have issued Coastal Zone Management Act consistency concurrences for one or more NWPs. Please check the appropriate Corps district web site to see if Coastal Zone Management Act consistency concurrence has already been issued for the NWP(s) you wish to use.

Attachment F: U.S. Army Corps of Engineers Section 404 Permit

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Attachment G: State Department of Health, Clean Water Branch Section 401

Electronic Signature CWB Individual Section 401 WQC Form

version 1.6

(Submission #: HQA-HVN0-WRCXD, version 1)

Details

Originally Started By	William F. Bow
Project Name	Kahauiki Stream Maintenance Dredging, Phase 2
Submission ID	HQA-HVN0-WRCXD
Status	Draft
Active Steps	Form Submitted.

Fees

Basic Submission Fee	$1,000.00
Payments/Adjustments	$0.00
Balance Due	$1,000.00 (None)

Form Input

Federal Permit Information

Provide the file number of the federal permit, license, certificate, approval, registration, or statutory exemption (e.g. POH-2014-01234). Contact the appropriate federal agency to obtain your file number. Do not contact the DOH-CWB for this information.
POH-2017-00079; POH-2025-00040

Specify the type of federal permit that is required for your project (e.g. Nationwide Permit, Programmatic General Permit, Individual Permit, Letter of Permission, POH Civil Works, Federal Energy Regulatory Commission, etc.). Contact the appropriate federal agency to obtain this information. Do not contact the DOH-CWB for this information.
Letter of Permission (POH-2017-00079); Nationwide Permit 3 (POH-2025-00040)

Provide the federal permit authorization (e.g. Clean Water Act Section 404; Rivers and Harbors Act Section 10; Marine Protection, Research, and Sanctuaries Act; etc.). Contact the appropriate federal agency to obtain this information. Do not contact the DOH-CWB for this information.
Section 10 (Rivers & Harbors Act); Section 404 (Clean Water Act)

Upload your federal agency application.
2025-03-07_Kahauiki Stream Dredging_Permit Application - Dredging (POH-2017-00079).pdf - 04/07/2025 09:59 AM
2025-04-02_Kahauiki Stream Dredging_NWP PCN - Culvert (POH-2025-00040).pdf - 04/07/2025 09:59 AM
Comment
NONE PROVIDED

The scope of work identified in your federal agency application is the activity you are requesting to be covered under the Section 401 WQC. If your federal agency application did not include a scope of work, please describe the scope of work below.
Please see the applications attached in the previous section.

Attachment G: State Department of Health, Clean Water Branch Section 401

Upload your federal agency determination or correspondence.

2025-02-07_USACE Correspondence.pdf - 02/20/2025 08:44 AM
POH-2017-00079_20250204_KahauikiMaintenanceDredging_LOP RFI_.pdf - 04/07/2025 10:04 AM

Comment

A letter was sent on February 4, 2025 requesting additional information to complete the project application review. A series of email correspondences followed leading to a virtual meeting/call. This meeting was on February 12, 2025 and further defined the USACE's interpretation of the project and their recommendation for the most efficient way to permit the activity. The application was revised to permit the activities under two separate permit applications; these applications are currently under review.

Owner Information

Owner Legal Name
U.S. Army Garrison Hawaii

Owner Department
NONE PROVIDED

Owner Division
NONE PROVIDED

Owner Mailing Address

947 Wright Avenue, Wheeler Army Airfield
Wahiawa, HI 96857

Owner Street Address

947 Wright Avenue, Wheeler Army Airfield
Wahiawa, HI 96857

Owner Type
Federal - Federal Government Project

Select the appropriate signatory type and confirm that the certifying person meets the requirements for the corresponding type. The certifying person must meet the applicable requirements and be employed by the owner.
Federal Agency

Federal Agency

I certify that for a federal agency, I am the chief executive officer of the agency, or I am the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

Certifying Person Salutation
Mr.

Certifying Person Information

First Name	Last Name
Nisit	*Gainey*

Title
Director of Public Works

Phone Type	Number	Extension
Business	808-787-6128	

Email
nisit.a.gainey@army.mil

Owner Contact Person

The owner contact person may be the staff person with direct responsibility for the facility or project, not necessarily the certifying or responsible person. The owner contact person must be employed by the owner.

Attachment G: State Department of Health, Clean Water Branch Section 401

Owner Contact Person Salutation
Ms.

Owner Contact Person Information

First Name	Last Name
Iris	*Endo*

Title
DPW Embedded Team - Project Manager

Organization Name
U.S. Army Corps of Engineers, Honolulu District

Phone Type	Number	Extension
Business	808-824-0365	

Email
Iris.E.Endo@usace.army.mil

General Contractor Information

Will General Contractor information be submitted within 7 calendar days before commencement of any activities covered under the Section 401 WQC?
Yes. I will provide general contractor information within 7 calendar days before commencement of any activities covered under the Section 401 WQC.

Emergency Contact Information

Emergency Contact No. 1 Salutation
Mr.

Emergency Contact No. 1 Information

First Name	Last Name
Nisit	*Gainey*

Title
Director of Public Works

Organization Name
U.S. Army Garrison Hawaii

Phone Type	Number	Extension
Business	808-787-6128	

Email
nisit.a.gainey.civ@army.mil

Emergency Contact No. 2 Salutation.
Ms.

Emergency Contact No. 2 Information

First Name	Last Name
Iris	*Endo*

Title
DPW Embedded Team - Project Manager

Organization Name
U.S. Army Corps of Engineers, Honolulu District

Phone Type	Number	Extension
Business	808-824-0365	

Email
Iris.E.Endo@usace.army.mil

Attachment G: State Department of Health, Clean Water Branch Section 401

Project Site Information

Enter the project name

The project name will appear on all correspondence, official files, and the Section 401 WQC.

Project Name
Kahauiki Stream Maintenance Dredging, Phase 2

Provide the government project/job no. only if you are a government agency.
W9128A22D0003

Provide a description of the location of the project (e.g. within Manoa Stream, 300 feet upstream of the Palolo Stream confluence).
Lower Ft. Shafter Flats within Kahauiki Stream

Island where the project is located
Oahu

Provide the project contact person information.

Provide the project contact person information. The project contact person is anyone that will be at the project site during construction (e.g. consultant, staff, etc.).

Project Contact Person Salutation
Ms.

Project Contact Person Information

First Name	Last Name
Iris	*Endo*

Title
DPW Embedded Team - Project Manager

Organization Name
U.S. Army Corps of Engineers, Honolulu District

Phone Type	Number	Extension
Business	808-824-0365	

Email
Iris.E.Endo@usace.army.mil

Project Contact Person Mailing Address

Building 230

Fort Shafter, HI 96858-5440

Tax Map Key (TMK) No.

TMK

Division (e.g., 1)	Zone (e.g., 9)	Section (e.g., 7)	Plat (e.g., 025)	Portion, Parcel, or Lot (e.g., Lots 1-10, 15, & 20)
1	1	1	008	001

Associated Permits or Licenses

National Pollutant Discharge Elimination System (NPDES) Permit(s)

The Section 401 WQC evaluates the entire project construction and operation. Discharges and activities covered under an NPDES permit are not evaluated in the Section 401 WQC. You are required to disclose any NPDES permits that are required for your project.

Attachment G: State Department of Health, Clean Water Branch Section 401

Does your project disturb 1 acre or more of land and require an NPDES permit authorizing discharges of storm water associated with construction activities?
Yes.

Provide the NPDES Permit number (e.g. HIS000952) and/or Notice of General Permit Coverage (NGPC) file number (e.g. HIR10E555) which is associated with your project activity.
NONE PROVIDED

Will your project involve any construction related point source discharges to State surface waters (e.g. dewatering effluent, hydrotesting effluent, well drilling effluent, etc.)?
Yes.

Provide the NPDES Permit number (e.g. HI0021898) and/or NGPC file number (e.g. HI14GE555) which is associated with your project activity.
NONE PROVIDED

Will your project have operational point source discharges to State surface waters?
No. I certify there will be no operational point source discharges.

Does your project/activity have a regulated Standard Industrial Classification Code that requires NPDES permit coverage?
Yes.

Provide the NPDES Permit number (e.g. HIS000751) and/or NGPC file number (e.g. HIR80E744) which is associated with your project activity.
NONE PROVIDED

You are required to certify that you are fully aware that there shall be no discharge of any type of wash waters (including concrete truck or rock washing water) or treated construction activity related effluent into State waters without first obtaining from the DOH an NPDES permit authorizing such type of discharge to State water(s).
Yes. I certify.

Other Associated Permits or Licenses

Provide information on any other associated permit or licenses.

For Superfund Amendments and Reauthorization Act (SARA), list the chemicals and quantities at the project site (if applicable). Enter "N/A" if not applicable.
N/A

Provide the Resource Conservation and Recovery Act (RCRA) Permit number for any hazardous wastes stored or used at the project (if applicable). Enter "N/A" if not applicable.
N/A

List all other associated permits or licenses (e.g. Underground Injection Control file number, Stream Channel Alteration Permit file number, Coastal Zone Management approval or file number, etc.), as applicable. Enter "N/A" if not applicable.
Stream Channel Alteration Permit

Receiving State Water(s) Information (1 of 1)

HAR, Section 11-54-1 defines State water(s) as:

All waters, fresh, brackish, or salt around and within the State, including, but not limited to, coastal waters, streams, rivers, drainage ditches, ponds, reservoirs, canals, and lakes; provided that drainage ditches, ponds, and reservoirs required as part of a water pollution control system are excluded. This chapter applies to all state waters, including wetlands, subject to the following exceptions: (1) This chapter does not apply to groundwater. (2) This chapter does not apply to ditches, flumes, ponds and reservoirs that are required as part of a water pollution control system. (3) This chapter does not apply to ditches, flumes, ponds, and reservoirs that are used solely for irrigation and do not overflow into any other state waters, unless such ditches, flumes, ponds, and reservoirs are waters of the United States as defined at 40 C.F.R. 122.2.

A receiving State water is the first State water that receives the discharge (e.g. if a discharge first enters a stream that flows to the ocean, the receiving State water is the stream).

Note: You must identify a receiving State water before a Section 401 WQC can be issued. The receiving State water is the State water the project/facility will be conducted in (e.g. if your project/activity is in Pearl Harbor then your receiving State water is Pearl Harbor). The receiving State water must be a surface water. Sample responses for this item include: Pacific Ocean at Sandy Beach, Honolulu Harbor, Pearl Harbor, Aiea Stream, Unnamed Stream, Kaloi Gulch, Unnamed Dry Gulch, Unnamed Wetlands, etc.

Receiving State Water Name
Kahauiki Stream

Select the receiving State water classification:

Classifications are defined in HAR, Chapter 11-54 and on the Water Quality Standards Maps available on the CWB website. The Water Qualtiy Standards Maps are provided for general information only and are to be used in conjunction with HAR, Chapter 11-54.

Click on the link below to download a copy of HAR, Chapter 11-54.
HAR, Chapter 11-54

The Water Quality Standards Maps can be found by clicking on the link below.

Note: The maps are a geographic representation of Hawaii State Water Quality Standards as set forth in Hawaii Administrative Rules Chapter 11-54, but are intended for reference only, not to substitute for the governing language in the Water Quality Standards.
Water Quality Standards Maps

Receiving State Water Classification (See HAR 11-54-5 and 11-54-6.)
Class 2, Inland

Receiving State Water Type
Stream, Natural Ditch, Natural Gulch

Receiving State Water Marine Bottom Type (See HAR 11-54-7.)
Soft Bottom Communities

Determine if the receiving State water is on the CWA 303(d) impaired water body list.

You are required to download the Integrated Report below and determine if the receiving water is on the CWA 303(d) impaired waterbody list.
Integrated Report

Is the receiving State water on the Section 303(d) list?
No

Additional Receiving State Waters

Select "Add New" to add additional receiving State waters. All receiving State waters must be identified.

Project Description

Provide the approximate center point coordinates of the in-water activity.
21.336848490990302,-157.892685950277

Describe the overall project scope and activities, including the project activities both in and out of State waters, the construction, or operation of facilities which may result in any direct and/or indirect "discharge" into State waters.
The U.S. Army Corps of Engineers is currently reviewing the work at Kahauiki Stream "A" as a Letter of Permission (POH-2017-00079) for dredging, and for the work at Kahauiki Stream "B" as a Nationwide Permit 3 for maintenance and repair of a culvert (POH-2025-00040). The work is needed to prevent and minimize flooding in the lower section of Fort Shafter Flats. The purpose of this project is to dredge the remaining areas of Kahauiki Stream A from the 2020 project and unblock or potentially repair (or replace) two 36-inch diameter concrete culvert drainage pipes in Kahauiki Stream B.

Dredging and clearing of the remaining section of Kahauiki A will remove approximately 2,526 CY of native coralline substrate and accumulated alluvial sediment within an area of 27,653 SF from within the stream. This will deepen the stream to -5.5 feet Mean Sea Level; the current depth varies between 1.5 - 3.5 feet below the water surface. The dredging will involve mechanized methods of sediment and vegetation removal. The exact dredging method (land versus water-based) dredging has not been determined, and will be based on the contractor-specific methods. Temporary structures such as dikes and equipment will not be allowed to be placed within the stream during construction. In-water Best Management Practices (BMPs) will be deployed to contain sediment during dredging operations and will minimize the spread of sediment to other areas of the stream and surrounding waters. These BMPs will include turbidity curtains, anchor ballasts, and booms. The dredged material will be placed in dump trucks and transported to an adjacent open field for dewatering. Dredged and fill material will not be discharged or placed back into the stream.

The in-water work in Kahauiki Stream B will be able to meet the conditions defined in the Blanket Section 401 Water Quality Certification (File No. 1092). This work includes the interior clearing the existing culverts consisting of two (2), 36-inch diameter reinforced concrete drainage pipes. Sediment will be cleared from the pipes' interior and dredging of the surrounding areas' accumulated sediment is recommended. Approximately 183 CY of sediment are planned to be removed from the 4,476 SF area within Kahauiki Strean B. The stream slopes will be graded to a 2:1 slope. The removed sediment will be placed in dump trucks and transported to an adjacent open field for dewatering. Dredged and fill material will not be discharged or placed back into the stream. A structural engineer will inspect the culvert's structural integrity after the culvert has been cleared. This will help to assess if any additional maintenance/repair is needed within the culvert. If the culverts need to be replaced, then approximately 13 CY of net fill (230 CY excavation, 243 CY fill) will be used in the 1,754 SF of disturbed area. The discharge of fill material in this area includes two new 36-inch RCP drain pipes, non-woven filter fabric, trench aggregate, rock and gravel, CSLM, and AC aggregate and pavement to match the existing finished grades. In-water BMPs will be used. Turbidity curtains, anchor ballasts, and booms may be used to contain sediment during operations and minimize the spread of sediment to other areas of the stream and surrounding waters.

Describe the "discharge" activity and the purpose of the proposed discharge activity. "Discharges" include but are not limited to storm water runoff, dredged spoil dewatering return flow and runoff, placement of backfill, pouring or placement of concrete, sand placement for beach nourishment, equipment in water, etc.
This project would serve to remove the solid coral and complete the dredging of accumulated sediment within Kahauiki Stream A which was not completed in a previous project. In order to create a fully functioning stream system passing under Annex Road (Kahauiki Stream B), unblocking and potential repair/replacement the two (2) existing 36-inch reinforced concrete drainage pipes is recommended.

The work within Kahauiki Stream B includes sediment that will be cleared from the pipes' interior and dredging of the surrounding areas. Approximately 183 CY of sediment from the 4,476 SF area within Kahauiki B to the merging of Kahauiki A will be removed. A structural engineer will examine and assess the two existing culverts after they are cleared to provide recommendations on the need of repairs and maintenance of these structures. The potential repair/replacement of two (2) upstream, 36-inch diameter reinforced concrete drainage pipes located within Kahauiki B at station would result in discharge to the waters. If the culverts need to be replaced, then approximately 13 CY of net fill (230 CY excavation, 243 CY fill) will be used in the 1,754 SF of disturbed area; no expanded area into the stream is expected for this work. The discharge of fill material in this area includes two new 36-inch RCP drain pipes, non-woven filter fabric, trench aggregate, rock and gravel, CSLM, and AC aggregate and pavement to match the existing finished grades.

List all "discharge" activities that the owner is seeking coverage for under this WQC application (e.g. sand replenishment, backfills, etc.).
In-water BMPs will be used. Turbidity curtains, anchor ballasts, and booms may be used to contain sediment during operations and minimize the spread of sediment to other areas of the stream and surrounding waters. These BMPS are temporary discharges and will be removed after construction activities are completed.

Dredged material, including the dewatering/drying of sediment, shall not be placed or allowed to flow back into the stream. No additional discharges are expected during dredging of Kahauiki Stream A.

The discharge of fill material (if the culverts need to be replaced) in Kahauiki Stream B includes two new 36-inch RCP drain pipes, non-woven filter fabric, trench aggregate, rock and gravel, CSLM, and AC aggregate and pavement to match the existing finished grades. This discharge is contingent upon the structural engineer's inspection after the culvert is cleared and surrounding areas are dredged. No removed sediment from Kahauiki Stream B will be allowed to flow back into the stream.

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Specify the physical, chemical, biological, thermal, and any other pertinent characteristic of the "discharge" activity. These may include: nutrients from dredging, pre-drilling, or pile-driving activities; turbidity from leaks during tremie concrete placement; etc.
Dredging and in-water work to remove sediment is expected to create temporary increases is suspended sediment in the water column. Isolation and containment via turbidity curtains is proposed as the primary BMP for containment during dredging operations.

If the culverts require replacement, then discharges of fill material are expected. In general, the proposed materials (RCP drain pipes, filter fabric, aggregate, rock, and gravel) are inert materials that will be contained within the contractor's work area. CSLM and AC aggregate will be used for various portions of the project and may require additional caution to ensure these do not enter the water, as pH, dissolved oxygen, temperature, and turbidity may be affected. Proper containment will be determined by the contractor, but will likely utilize water-tight forms, floating booms, and turbidity curtains to ensure containment during the work.

Existing Environment and Potential Effects

Describe the existing physical environment and the potential physical environmental effects. Your description needs to address the environmental effects on water, land, sediment, soil, air, etc.
Please see the attached "Site Engineering Investigation Report" and "Record of Environmental Consideration" for the project at Kahauiki Stream.

The project aims to mitigate flooding in the lower reaches Moanalua Stream. Kahauiki Stream is a critical path for the flow of other inland waters toward Keehi Lagoon. Kahauiki Stream "B" currently has two clogged culverts surrounded by high levels of sediment. Sediment removal and dredging in this area and in the lower areas of Kahauiki Stream "A" will help restore the flow to the stream and minimize flooding upstream during future rain events.

The project will have minimal effects to the marine environment based on the Record of Environmental Consideration document prepared for this project. This document provides environmental impact analysis of air quality, water quality, topography and soils, natural resources (including endangered, threatened species, and critical habitat), cultural resources, land use, noise, traffic, hazardous/toxic materials, utilities, and flooding.

The areas of work are shallow due to the accumulation of sediment and due to the absence of stream flow, the presence of fish and habitat has been significantly diminished. All material removed through mechanical methods shall be trucked to a nearby field that will be set up as a dewatering pit/basin. No water or dredged material shall re-enter the stream after it has been removed. The land-based work exceeds 1-acre and will be permitted through an NPDES - Form C for storm-water related discharges associated with construction. The accumulated sediment will be disposed of to an appropriate landfill or at an upland facility depending on the analysis of sediment and requirements by DOH-SHWB and the HEER offices.

Attach a survey report, if available, and photographs of the existing physical environment. You may upload multiple files. It is recommended that you keep each file below 10 MB.
SEI Report Kahauiki Stream Maintenance Dredging, phase 2 Design Complete.pdf - 02/20/2025 12:03 PM
Record of Environmental Consideration_FS Kahauiki Stream Dredging (4559)_APPROVED(2).pdf - 04/07/2025 11:02 AM
Comment
NONE PROVIDED

Describe the existing chemical environment and potential chemical environmental effects. Your description needs to include the environmental effects on the water column, sediments, air, etc.
Kahauiki Stream is listed as a Class 2 inland water body. The portion of the stream where work is to be performed usually has water present that is brackish with fluctuating salinity concentrations due to tidal influence. Kahauiki Stream is a tributary to the Moanaula Stream. Although Kahauiki Stream is not listed as an impaired water body under Clean Water Act 303(d), Moanalua Stream is listed as an impaired water body for both the dry and wet season. For the dry season, Moanalua Stream is impaired for total nitrogen, turbidity, and trash; for the wet season, Moanalua Stream is impaired for total nitrogen and trash. For both seasons, Moanalua Stream has been assigned a TMDL priority code of "high". Other water quality parameters including nitrate/nitrite, total phosphorous, and total suspended solids were evaluated and assessed as ﷺgoodﷺ.

The chemical environmental effects caused by the project are expected to be minimal based on past maintenance dredging at the site. While the presence of potential pollutants of concern cannot be ruled out due to the uncertainty of upstream contributions to the area, containment during in-water work and sediment dewatering/drying, should mitigate any potential chemical environmental effects.

Attach monitoring data for the existing chemical environment. You may upload multiple files. It is recommended that you keep each file below 10 MB.
NONE PROVIDED
Comment
Past water quality and sediment data is available from previous maintenance dredging, but was not available at the time of this submittal.

Describe the existing biological environment and the potential biological environmental effects. List all species, specifically native species, and habitats for the existing biological environment. Provide a discussion on the environmental effects on plants, animals, and habitats.
There are no critical habitats listed for in the project area. The following species are listed as endangered in the USFWS Information for Planning and Consultation for the project area:

Hawaiian Hoary Bat (Lasiurus cinereus semotus)
Band-rumped Storm-petrel (Hydrobates castro)
Hawaiian Common Gallinule (Gallinula galeata sandvicensis)
Hawaiian Coot (alae Ke`oke`o, Fulica ala)
Hawaiian Duck (Anas wyvilliana)
Hawaiian Petrel (Pterodroma sandwichensis)
Hawaiian Stilt (Himantopus mexicanus knudseni)
Newell's Shearwater (Puffinus newelli)
Hawksbill Sea Turtle (Eretmochelys imbricata)
`Akoko (Euphorbia celastroides var. kaenana)
`Ena`ena (Pseudognaphalium sandwicensium var. molokaiense)
Carter's Panicgrass (Panicum fauriei var. carteri)
Ihi (Portulaca villosa)
Ohai (Sesbania tomentosa)

These species are unlikely to be affected by the project activities due to all the work being performed in the water or on existing structures; no impacts to flora or fauna are expected. There is no tree removal or vegetation removal involved with the project, so the Hawaiian Hoary Bat, if present, will not be impacted. The listed water birds may visit the site temporarily, however, the site is not a known nesting area for these species. Due to tidal influence and storm flooding, the stream banks are not ideal for these species to nest and reside. Construction-related impacts would not impact bird species, as the work areas will be isolated into smaller work areas, allowing for the birds to still access and use the stream.

The Hawksbill Sea Turtle (Eretmochelys imbricata) is unlikely to be encountered due to the inland and upstream location of the project site relative to the ocean and nearest habitat for this species.

Describe the existing uses at the project site and the potential effects from your proposed activity. HAR 11-54-1 defines existing uses as those uses actually attained in the water body on or after November 28, 1975 whether or not they are included in the water quality standards. Existing uses could include recreational activities, propagation of fish, shellfish, or other aquatic animals, plants, etc.
This area is a Class 2 Inland water with their uses defined to be for recreational purposes, the support and propogation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The effects from the proposed activity should help to restore the true function of this stream, to allow better flow through the passage of the lower Ft. Shafter Flats into Moanalua Stream. Any impacts would be temporary and isolated due to the in-water dredging and potential repair/replacement of the drainage pipes.

Kahauiki Stream is prone to flooding with record of historical flood events. Dredging efforts were initiated in 2020 to mitigate flooding but were not completed due to numerous differing site conditions, including solid rock formation, and permitting complications within Kahauiki Stream "A". The unblockage or potential repair/replacement of the two existing 36-inch reinforced concrete
drainage pipes located in Kahauiki Stream "B" is also included. This portion of the stream passes under Annex Road between Funston Loop and Mokumoa Street.

Describe how your activity will maintain and protect existing uses. HAR 11-54-1.1 requires that the existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
The effects from the proposed activity should help to restore the function of this stream, to allow better flow through the passage of the lower Ft. Shafter Flats into Moanalua Stream. Any impacts would be temporary and isolated due to the in-water dredging and potential repair/replacement of the drainage pipes. The increased flow will help to increase the support and propogation of aquatic life; the current limited and restricted flows do not allow for sustainable aquatic life in portions of the stream. Flood mitigation during storm events are also a secondary (benefit) that will result from the completion of this project.

Project Schedule

Provide the estimated date when the activity will begin.
07/01/2025

Provide the estimated date when the activity will end.
12/31/2025

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Provide the estimated date when the discharge(s) will begin.
07/15/2025

Provide the estimated date when the discharge(s) will end.
12/15/2025

Site-Specific Best Management Practices (BMPs)

a. Attach map(s) showing the location of the project site (i.e., ocean, stream, wetlands, estuary, reservoir, etc.) and structural control measure(s) including typical section(s), stockpiling site(s), treatment facility(ies), return flow discharge site(s), etc. You may upload multiple files. It is recommended that you keep each file below 10 MB.

2024-09-05_Civil Design - Kahauiki Stream.pdf - 02/20/2025 01:13 PM

Comment
NONE PROVIDED

b. Provide a site characterization which identifies the ambient conditions at the project site and a description of any specific measures needed to protect the ecosystem at the project site.
There are no critical habitats identified in the project area. Temporary effects caused by in-water work will be isolated with in-water BMPs. Turbidity curtains shall be used as the primary containment during dredging. Water-tight form work may be used if the drainage pipes require maintenance or replacement. Small areas will be isolated to allow stream flow throughout the project. Additional contractor-specific means and methods are still being developed.

c. Provide the construction sequence and duration. The construction sequence constitutes an important portion of the water pollution control plan. The construction sequence shall be arranged to minimize the potential adverse impact(s) resulting from the proposed activities. The construction schedule shall be clearly described, particularly, the schedule for any in-stream and/or in-water work. Selection of the dry-season, low-flow, or no-flow period to conduct the in-stream construction activities is preferred.
This is still being determined and will be based on contractor-specific methods and schedule. Ideally, the project will be awarded to allow most of the in-water work to be performed during the summer/fall months (June - October). Land-based work may extend into December.

d. Identify the specific construction method(s) to be applied with respect to each type of construction activity proposed including a description of the type of equipment involved and how and where this type of equipment would be employed.
This is still being determined and will be based on contractor-specific methods, but will likely involve mechanical equipment for dredging and sediment removal. Land-based or water-based excavation are being explored for the work within Kahauiki Stream A and Kahauiki Stream B.

e. Provide a contingency plan to ensure that even under the worst case scenario, the activity will have minimal adverse impact(s) on State water(s).
This is still being studied for incorporation into the project design and specifications.

f. Provide the characteristics of the discharge and potential pollutants associated with the proposed construction activity. The potential discharge needs to be described by specifying the source, composition of the source, quantity, and duration. This includes: materials placed or to be placed, both temporarily or permanently, into State water(s); materials that may enter State water(s) due to the proposed construction activities such as soil erosion, discharges from the trenching activity, bedding materials, construction debris, removed vegetation and soil attached to the roots, construction dewatering effluent discharges, hydrotesting effluent discharges, storm water discharges associated with the construction activities, runoff from excessive construction site dust control process, runoff from stockpiling site; materials that may re-enter State water(s) such as runoff or return flow from the dredged/excavated material dewatering site or runoff from the dredged/excavated material stockpiling site(s); discharges associated with the operation and maintenance of the equipment involved, such as oil leak(s) from the equipment, spills from the equipment fueling operations, spills from the fuel storage facility, etc.; and temporary structure(s) construction, removal and restoration related discharges such as from the construction and removal of berm(s), dike(s), cofferdam(s), sheet piling(s), sandbag(s), silt curtain(s), etc.

Source	Composition	Quantity	Quantity Units	Duration	Duration Units
Culvert Crossing	Rock, gravel	53	CY	15	Days
Culvert Crossing	CSLM	70	CY	2	Days
Culvert Crossing	Reinforced Concrete Pipes	25	CY	5	Days

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Source	Composition	Quantity	Quantity Units	Duration	Duration Units
Culvert Crossing	AC aggregate/pavement	82	CY	30	Days
Culvert Crossing Form-work	Composite materials	TBD	Other: This is still being determined.	30	Days
Turbidity Curtain	Mixed materials	200	Other: Lineal Feet	180	Days

h. Provide the characteristics of the dredged/excavated material (wet or dry)

Source	Composition	Quantity	Quantity Units	Duration	Duration Units
Dredged Sediment	Silt	183	CY	30	Days
Dredged Material	Coral, alluvial sediment	2,526	CY	60	Days
Culvert Crossing	Concrete Pipes	25	CY	30	Days
Culvert Crossing	Aggregate, rock, gravel	230	CY	30	Days

Provide the proposed control measures and/or treatment. The selection of the most appropriate and effective control measure(s) shall be based on the information obtained in Items 12.a through 12.h. In some cases, treatment is required before the discharges can be permitted to enter or re-enter the State water(s).
Containment of in-wate work areas shall consist of the use of turbidity curtains and water-tight formwork. On land, a dewatering/drying basin will be constructed in an adjacent open field; no-water shall be allowed to leave this area. No dredged spoils shall be allowed to be placed back into the water.

Monitoring and Assessment Plan

a. Provide a description of the methods and means proposed to monitor the quality and characteristics of the discharge. Include: i. Monitoring parameters; ii. Type of sample (i.e., grab, composite, etc.); iii. Sampling devices; iv. Units of measure; v. Sampling frequency; vi. Sampling method; vii. Sampling location(s) of the monitoring point(s) on a map; and viii. Quality Assurance/Quality Control Methods.
Please see the attached "Applicable Monitoring and Assessment Plan for Kahauiki Stream Maintenance Dredging, Phase 2".

b. Describe the methods and means to monitor/maintain all pollutant control measures.
Please see the attached "Applicable Monitoring and Assessment Plan for Kahauiki Stream Maintenance Dredging, Phase 2".

c. Provide the reporting requirements, including the time and frequency of the reports (i.e., every month, etc.) and content of the report. All reports to the DOH must be through the e-Permitting Portal WQC Compliance Form.
Please see the attached "Applicable Monitoring and Assessment Plan for Kahauiki Stream Maintenance Dredging, Phase 2".

d. Provide a narrative of how the monitoring results will be used to demonstrate whether or not the project construction activity was in compliance with the applicable State water quality standards.
Please see the attached "Applicable Monitoring and Assessment Plan for Kahauiki Stream Maintenance Dredging, Phase 2".

If desired, you may upload your Monitoring and Assessment Plan. You may upload multiple files. It is recommended that you keep the file size below 10 MB.

NONE PROVIDED
Comment
NONE PROVIDED

Choice of Publication

My choice of publication is:
Public Notice

Mitigation/Compensation Plan

Mitigation/Compensation Plan

NONE PROVIDED
Comment
NONE PROVIDED

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Authorized Representative

Do you wish to designate an authorized representative?
No

Payment Information

How are you planning to pay the filing fee for this submission?
Online Payment

Attachments

Date	Attachment Name	Context	Confidential?	User
4/7/2025 11:02 AM	Record of Environmental Consideration_FS Kahauiki Stream Dredging (4559)_APPROVED(2).pdf Attachment E of SCAP Application	Attachment	No	William Bow
4/7/2025 10:04 AM	POH-2017-00079_20250204_KahauikiMaintenanceDredging_LOP RFI_.pdf	Attachment	No	William Bow
4/7/2025 9:59 AM	2025-03-07_Kahauiki Stream Dredging_Permit Application - Dredging (POH-2017-00079).pdf	Attachment	No	William Bow
4/7/2025 9:59 AM	2025-04-02_Kahauiki Stream Dredging_NWP PCN - Culvert (POH-2025-00040).pdf Attachment F of SCAP Application	Attachment	No	William Bow
2/20/2025 1:13 PM	2024-09-05_Civil Design - Kahauiki Stream.pdf Attachment C of SCAP Application	Attachment	No	William Bow
2/20/2025 12:03 PM	SEI Report Kahauiki Stream Maintenance Dredging, phase 2 Design Complete.pdf	Attachment	No	William Bow
2/20/2025 8:44 AM	2025-02-07_USACE Correspondence.pdf	Attachment	No	William Bow

Status History

	User	Processing Status
2/20/2025 8:34:49 AM	William F. Bow	Draft

Processing Steps

Step Name	Assigned To/Completed By	Date Completed
Form Submitted.		
In Review		
Issue Individual Section 401 WQC		

Attachment G: State Department of Health, Clean Water Branch Section 401

DEPARTMENT OF THE ARMY
HONOLULU DISTRICT, U.S. ARMY CORPS OF ENGINEERS
230 OTAKE STREET, CEPOH-RO
FORT SHAFTER, HAWAII 96858-5440

February 4, 2025

SUBJECT: US Army Garrison Hawaii, Kahauiki Maintenance Dredging Phase 2., Kahauiki Stream, Honolulu, Island of Oahu, Hawaii
DA File No. POH-2017-00079

Nisit Gainey
U.S. Army Garrison Hawaii
947 Wright Avenue
Wheeler Army Airfield, Hawaii 96857

Mr. Gainey,

The U.S. Army Corps of Engineers (Corps) received your request dated December 6, 2024 for Department of Army (DA) authorization to Dredge Kahauiki Stream located alongside Funston Road, Mokumoa Street and Annex Road; Tax Parcel ID(s) 1-1-008:001, 1-1-006:001,004,013; Kahauiki Stream, Honolulu, Island of Oahu, Hawaii, 96819. Your project has been assigned DA File No. POH-2017-00079. Please refer to this number in all future correspondence.

We have completed review of your submittal pursuant to Section 404 of the Clean Water Act (Section 404). Section 404 requires authorization prior to the discharge and/or placement of dredged or fill material into waters of the U.S., including adjacent wetlands.

It appears your proposed maintenance dredging will result in the discharge of fill material into the Kahauiki Stream. Therefore, you must obtain a Department of the Army Permit (DA) from this office prior to commencing your proposed work in accordance with Section 404.

The proposed work exceeds the requirements of our Nationwide Permits and will be evaluated as a Letter of Permission. An agency notice describing your proposed project has been issued to relevant resource agencies according to regulation. Opportunity will be given for other agencies to provide written comments on the project for a period of 15 days. Following the close of the comment period, this office will review the comment letters received, as well as your responses to the letters, conduct a public interest review and prepare the appropriate environmental documentation. A determination will then be made concerning issuance or denial of your permit.

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Based on an initial review of the materials you submitted, your application is considered incomplete at this time. The following information is required to complete your application and issue the public agency coordination letter.

Per 33 CFR 325.3(a)

1. A list of other government authorizations obtained or requested by the applicant, including required certifications relative to water quality, coastal zone management, or marine sanctuaries;

2. A statement about the knowledge of any Federally-listed species or designated critical habitat protected by the Endangered Species Act that might be affected by or is in the vicinity of the project;

3. A statement about the knowledge of the presence or absence of Historic Properties. Historic Properties includes a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places. If available provide any archeological inventory or cultural resource surveys, including any correspondence with the State Historic Preservation Division.

Once the above information is received, a public notice describing your project will be sent. More information may be requested at a later date to determine compliance with the Section 404(b)(1) Guidelines, National Environmental Policy Act, Endangered Species Act, and other applicable regulations.

Before authorizing work under our statutory authorities, the Corps must ensure a project complies with other applicable Federal laws and regulations including the Endangered Species Act (ESA), Magnuson-Stevens Act (MSA), National Historic Preservation Act (NHPA) and Coastal Zone Management Act (CZM). Because The Department of the Army is the Lead Federal Agency, they are responsible for providing documentation to our office demonstrating that the project is in compliance with ESA, MSA, NHPA and CZM.

Section 40l(a)(l) of the Clean Water Act requires that you obtain a Water Quality Certification or waiver from the State of Hawaii, Department of Health, Clean Water Branch. For additional information, please contact the Clean Water Branch at (808) 586-4309 or CleanWaterBranch@doh.hawaii.gov. A final DA permit will not be issued until this office has received a copy of the approved 401 WQC.

This office will not continue to evaluate your project until we receive the information requested above. Providing a response to this letter in a timely manner will ensure efficient processing of your permit. Failure to respond within thirty (30) days of the date of this letter, providing either the requested information or a request for additional time

to gather the information, will result in the withdrawal of your application. Upon receipt of the requested information, this office will continue the evaluation of your project.

Thank you for your cooperation with the Honolulu District Regulatory Program. Should you have any questions related to this determination, please contact Connor Gallagher at 808-835-4107 or via e-mail at Connor.C.Gallagher@usace.army.mil. You may also contact the main office at CEPOH-RO@usace.army.mil and 808-835-4303.

Sincerely,

Connor Gallagher,
Regulatory Specialist

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U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

For use of this form, see 33 CFR 325. The proponent agency is CECW-COR.

Form Approved - OMB No. 0710-0003 Expires: 2027-03-31

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at . Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website:

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
POH-2017-00079			

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Nisit Middle - A Last - Gainey	First - William Middle - F Last - Bow
Company - U.S. Army Garrison Hawaii	Company - Kahewai Environmental LLC
E-mail Address - nisit.a.gainey.civ@army.mil	E-mail Address - wbow@kahewai.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 947 Wright Avenue, Wheeler Army Airfield	Address- 2855 E. Manoa Road, Ste. 105, #316
City - Wahiawa State - HI Zip - 96857 Country - USA	City - Honolulu State - HI Zip - 96822 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business c. Fax	a. Residence b. Business 808-371-0676 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, William F. Bow to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Kahauiki Stream Maintenance Dredging, Phase 2 (Kahauiki A)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Kahauiki Stream	Address Funston Road, Mokumoa Street, and Annex Road
15. LOCATION OF PROJECT	City - State- Zip-
Latitude: °N 21.337302460931557 Longitude: °W 157.8918803539242	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID 1-1-006:001,004,013 Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE
From Daniel K. Inouye International Airport, take Aolele Street to Puuloa Road (1.5 miles). Take a left turn onto Puuloa Road and take the

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USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

In-water BMPs will be used and are temporary discharges. Turbidity curtains, anchor ballasts, and booms may be used to contain sediment during operations and minimize the spread of sediment to other areas of the stream and surrounding waters. Dredged and fill material will not be discharged or placed back into the stream. Coral substrate and alluvial sediment will be dredged and removed from areas of Kahauiki Stream "A".

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
No permanent discharge	N/A	N/A

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres No fill or discharge is included in this dredge project.

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Project plans (attached) include the use of both in-water and land-based best management practices (BMPs). In-water BMPs include the use of turbidity curtains as the primary containment device that will be used to minimize the spread of sediment into surrounding waters. Land-based BMPs will include sediment fences, rolls, and other measures to ensure runoff back into waters of the United States does not occur. Dredge sediment will be stockpiled in the adjacent field setback far from the stream to avoid runoff back into the stream.

24. Is Any Portion of the Work Already Complete? (●) Yes ( ) No IF YES, DESCRIBE THE COMPLETED WORK

The work described in this permit application have not been started. Maintenance dredging of other portions of the stream as a part of the 2020 project (POH-2017-0079) were completed, and excluded the areas covered by this project.

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- 606 Middle Street

City - Honolulu State - Hawaii Zip - 96819

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

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d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

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SITE ENGINEERING INVESTIGATION REPORT

KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

FORT SHAFTER FLATS INSTALLATION, ISLAND OF OAHU, HAWAII

CONTRACT NO. W9128A22D0003

Prepared For:

U.S. Army Corps of Engineers, Honolulu District

Prepared By:

Okahara and Associates, Inc.

Date: January 2024

DESIGN COMPLETE SUBMITTAL

NOT RELEASED FOR CONSTRUCTION

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ACRONYMS AND ABBREVIATIONS

FEMA: Federal Emergency Management Agency
FEWR: Facilities Engineering Work Order Request
FIRM: Flood Insurance Rate Map
MSL: Mean Sea Level
RCP: Reinforced Concrete Pipes
SCAP: Stream Channel Alteration Permit
SEI: Site Engineering Investigation
SOW: Scope of Work
UFC: Unified Facilities Criteria

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SECTION 1 - EXECUTIVE SUMMARY

1.1 Description of Project

Kahauiki Stream is a tributary upstream of Ke'ehi Lagoon, located in Honolulu, island of Oahu, Hawaii. See *Figure 2-1 – Island Map* and *Figure 2-2 – Vicinity Map*.

The project site is generally located along Kahauiki Stream "A" along the southwestern portion of Fort Shafter Flats Installation. In general, the section of Kahauiki Stream "A" included in this study was observed to be in a northeast to southwest orientation and is located near the stream's intersection with Moanalua Stream to the west. The section of Kahauiki Stream "B" included in this study was observed to be in an east to west orientation and is located near the stream's intersection with Kahauiki Stream "A" to the west. See *Figure 2-3 – Kahauiki Stream Project Area*.

Kahauiki Stream is prone to flooding with record of historical flood events. As such, dredging efforts were initiated in 2020 to mitigate flooding but were not completed due to numerous differing site conditions, including solid rock formation, and permitting complications. See *Appendix A – Scope of Work, August 2022*.

This study generally involves the dredging and clearing of the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50. See *Appendix D – Approximate Area where Solid Formation was encountered* and *Appendix E – Photographs of Solid Formation*. This study also includes the unblockage or potential repair/replacement of the two (2) existing 36-inch reinforced concrete drainage pipes located near Kahauiki Stream "B" at station 2+00. This portion of the stream passes under Annex Road between Funston Loop and Mokumoa Street. See *Appendix F – Location of Concrete Drainage Pipes*.

The work of this project is divided into two (2) phases: an investigation phase and a design phase. The design phase will be awarded at a later time, and it is not part of this scope of work (SOW). The purpose of the investigation phase along Kahauiki Stream "A" is to determine the approximate limits and thickness of the solid formation, identify its material composition, and to provide recommendations for its removal down to elevation -5.5 feet Mean Sea Level (MSL). The purpose of the investigation phase along Kahauiki Stream "B" is to assess the two (2) 36-inch reinforced concrete drainage pipes (RCP) and provide recommendations to unblock them.

ControlPoint Surveying, Inc. performed a topographic surveying and land mapping of the area in May 2023; see *Appendix G – Topographic Survey*, dated May 2023 and revised in November 2023. Kokua Geotech, LLC (Kokua)

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performed a geotechnical engineering exploration of the area in June 2023; see *Appendix H – Geotechnical Investigation Report*, dated December 2023.

1.2 Summary of the Site Engineering Investigation (SEI) findings

1. Kahauiki Stream "A": Okahara and Associates, Inc. (Okahara) visited the site on June 29, 2023 to conduct site observations concurrently with Kokua's boring work. At Kahauiki Stream "A", the area where a hard formation was discovered in the channel was visibly shallower and of a different material than surrounding areas. The east bank of the stream exposed what appeared to be a coral rock formation in the same area as where the hard formation was found within the stream bed. The initial indication in the field was that the hard material was, in fact, a coral rock formation and that dredging of the material will not require special construction methods.

   Kokua explored the subsurface conditions along Kahauiki Stream "A" by drilling and sampling four (4) stream borings, designated as Borings Nos. 1 through 4. See *Site Plan – 1, Plate 2.1* in *Appendix H – Geotechnical Investigation Report* for their locations.

   The purpose of the investigation phase along Kahauiki Stream "A" is to determine the approximate limits and thickness of the solid formation, identify its material composition, and to provide recommendations for its removal down to elevation -5.5 feet Mean Sea Level (MSL). A summary of the coralline detritus in the borings along Kahauiki Stream "A" is presented in the table below.

Table 1.1 – Summary of Coralline Materials Encountered in Borings

Boring No.	Depth to Mudline below Water Surface [feet]	Approximate elevations of Coral Materials [feet MSL]	Approximate Thickness of Coral below Mudline [feet]	Material Composition
1	1.5	-1.5 to -14.5	>13	Very loose to medium dense Silty Sand (SM) with little gravel (coralline detritus)
2	2.4	-2.4 to -7.0	4.6	Loose to medium dense Silty Gravel (GM) with some sand (coralline detritus)
3	3.5	N/A	N/A	No coralline materials encountered
4	3.1	N/A	N/A	No coralline materials encountered

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For the approximate lateral extent of the coralline materials exposed along the stream bed and encountered in the abovementioned borings, as well as the exposed coralline materials observed along the southern stream bank, see *Site Plan – 1, Plate 2.1* in *Appendix H – Geotechnical Investigation Report*.

2. Kahauiki Stream "B": Okahara visited the site on June 29, 2023. The two (2) existing 36" RCP culverts under the road were not visible due to the sediment build up and murky water. Water in the channel appeared to be stagnant and not flowing in any direction. The eastern, discharge end of the pipe culverts were slightly overgrown with shrubs and visibly shallow depth of water to stream bed.

   KAI Hawaii, Inc. (KAI Hawaii) visited the site on December 20, 2022 to view if the two (2) 36-inch diameter RCP pipes could be seen below the water surface on either side of the roadway crossing over the two pipes, but no part of either pipe could be seen. Dredging to expose the pipes is not permitted at this stage of the project. Therefore, KAI Hawaii was limited to a "desk top" assessment of the drain pipes. Invert elevations of the pipes indicated in the construction drawings for "FY21 Kahauiki Stream Maintenance Dredging Project" were compared to the ones indicated in Topographic Survey mapping done by ControlPoint Surveying, Inc. in May 2023 and revised in November 2023.

   Based on this comparison, it is estimated that the pipes are buried in sediment. The depth of sediment from the pipe invert:
   - West End Sediment Depth = 3.79 feet (1.04 feet over top of pipe)
   - East End Sediment Depth = 0.04 feet (just above the invert)

   Although it appears the upstream end of the pipes might be exposed in a stream bed depression, with the downstream end buried in about 1 foot depth of sediment above the tops of the pipes, it is very likely these two drain pipes are blocked with sediment for the full volume or very near the full volume of those pipes.

   The condition of the RCP is unknown due to lack of access, but RCP has a service life upwards of 100 years. So, there's a good chance the pipes are in a service-ready condition.

Kokua Geotech also explored the subsurface conditions along Kahauiki Stream "B" by drilling and sampling one (1) land boring, designated as Boring No. 5. See *Site Plan – 2, Plate 2.1* in *Appendix H – Geotechnical Investigation Report* for its location. Groundwater was encountered during the geotechnical field exploration in the boring near Kahauiki Stream "B" (Boring no. 5) at a depth of about 5 feet below the existing ground surface. See *Appendix H – Geotechnical Investigation Report* for additional details.

1.3 Summary of the Recommended Improvements and Repairs

1. Kahauiki Stream "A": The excavation of the solid formation located near Kahauiki Stream "A" from station 1+50 to 5+50 has been divided into three (3) areas:

    - Area 1: coralline material found within the stream bed, depicted in light blue in *Site Plan – 2, Plate 2.1* in *Appendix H – Geotechnical Investigation Report*.
    - Area 2: coralline material found within the stream bed, depicted in purple in *Site Plan – 2, Plate 2.1* in *Appendix H – Geotechnical Investigation Report*.
    - Area 3: alluvial sediment found in the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50, depicted in orange in *Figure 3-4 – Alluvial Deposit (Kahauiki Stream "A")*.

    It is anticipated that most of the coralline material may be excavated with normal heavy excavation equipment. However, excavations encountering boulders and hard coral formation may require the use of hoe rams. It should be noted that coral formations typically contain localized hard and crystallized zones. Therefore, it is anticipated that some difficult excavation conditions may arise in localized areas during construction when the coral formation is encountered.

    The total estimated cut quantity to dredge and clear the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50 is 6,395 cy. The individual cut quantities, separated by areas are as indicated in the table below:

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Table 1.2 – Quantities (Kahauiki Stream "A")

	Cut [cy]
Area 1	1,105
Area 2	210
Area 3	5,080
Total	**6,395**

Permits:

- An NPDES Permit C – Discharges of storm water associated with construction activities will be needed for the excavation of the solid formation located near Kahauiki Stream "A".

- It is anticipated that a Stream Channel Alteration Permit (SCAP) is required since this project involves permanent activity within the stream bed.

- Army Corps Section 404 Permit or applicable Nationwide Permit and State of Hawaii Department of Health Section 401 Water quality certification are also anticipated to be needed.

2. Kahauiki Stream "B": Due to the service life of RCP pipes upwards of 100 years, it is expected that the pipes will require minor repairs to be put back in service after the sediment is cleared from the pipe interiors. In order to create a fully functioning stream system passing under Annex Road, it is recommended to unblock and repair the two (2) existing 36-inch reinforced concrete drainage pipes.

   What follows below is the summary of the recommended improvements and repairs:

   - Dredge the bottom of the stream to remove the accumulated sediment down to the invert of the drain pipes, then clear the pipes of accumulated sediment inside of both drain pipes and remove this displaced sediment and wash water from the stream bed. The recommended method for clearing the sediment is the use of hydro-cleaning jets. If roots or larger rocks are in the pipe, personnel may need to access the pipe to clear those elements.

   - Have either remote camera-enabled vehicles or a diver go down into the stream to view the drain pipe condition at both ends and the interior if possible.

- Perform repairs, if any, to the drain pipes to create a fully functioning stream system passing under Annex Road while the pipes are in a dry condition while the cofferdam is in place. The types of repairs that we recommend be performed to the existing pipes include spalls or cracks that can be pressure-injected with epoxy. Or spalls at ends of pipe or interior surface can be repaired using a repair mortar with high early strength with a bonding agent applied first at the repair area.

- Conditions that a pipe replacement would be recommended would be a collapse of the pipe or if a full transverse crack for the full circumference of the pipe has occurred.

The table below summarizes the various cut quantities for Kahauiki Stream "B":

Table 1.3 – Quantities (Kahauiki Stream "B")

	Cut [cy]
North Pipe	4.28
South Pipe	4.19
Upstream Area	1.80
Downstream Area	3.40
Total	**13.66**

If the pipe condition assessment indicates that a complete replacement is needed, the new drain lines would likely be installed using conventional open trench (cut-and-cover) methods. This will require an excavation depth on the order of about 7 to 8 feet for the installation of the new piping. Due to the relatively shallow groundwater level encountered at the project site during the geotechnical field investigation, that the piping to be installed will likely extend below the groundwater level. Therefore, dewatering of the excavation will be necessary for this installation.

Although outside the SOW of this project, it is recommended to dredge the downstream portion of Kahauiki Stream "B" up to where it merges with Kahauiki Stream "A" to a depth of -4.6 MSL with stream banks sloped 2:1 to existing ground. The total estimated cut quantity is 195 cy.

This is recommended to reduce the amount of sediment immediately downstream and above the invert of the culvert pipes.

The total estimated cut quantity to dredge from the downstream (west side) area to the conjunction to Kahauiki Stream “A” in order to remove the accumulated sediment is 195.00 cy.

To conclude, the various cut quantities to dredge and clear Kahauiki Stream “B” are:

Table 1.4 – Quantities (Kahauiki Stream “B”, outside SOW)

	Cut [cy]
North Pipe	4.28
South Pipe	4.19
Upstream Area	1.80
Downstream Area to Kahauiki Stream “A”	195.00
Total	**205.27**

Permits:

- If the dewatering operation involves the discharge of groundwater from the dewatering operation into adjacent systems, an NPDES Permit G – Discharges of construction activity dewatering will be necessary.

- It is anticipated that a Stream Channel Alteration Permit (SCAP) is required since this project involves permanent activity within the stream bed.

- Army Corps Section 404 Permit or applicable Nationwide Permit and State of Hawaii Department of Health Section 401 Water quality certification are also anticipated to be needed.

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SECTION 2 - INTRODUCTION

2.1 Description of Project

Kahauiki Stream is a tributary upstream of Ke'ehi Lagoon, located in Honolulu, island of Oahu, Hawaii. The Kalihi-Moanalua Area is located on the southern coast of Oahu and has two major streams, Kalihi and Moanalua, which contribute to flood problems. Moanalua stream drains an area of approximately 9.8 square miles and is located on the western edge of the City of Honolulu. The drainage basin is an elongated rectangle, approximately 6.3 miles long, which varies in width from approximately 0.6 to 1.8 miles. The basin extends from the Ko`olau Mountains, at an elevation of over 2,000 feet to the Pacific Ocean at Keehi Lagoon. Moanalua stream has its origin and primary course in a sharply defined valley lying to the northwest of Moanalua Road. Manaiki stream, a small tributary, meets Moanalua Stream above the Moanalua Road bridge, and the combined stream winds through the narrow, flat coastal plain until it joins Kahauiki Stream "A" and outlets into the Keehi Lagoon. Within the coastal area there is an industrial area on the west bank of Moanalua Stream and a military reservation on the east bank[1]. See *Figure 2-1 – Island Map* and *Figure 2-2 – Vicinity Map*.

Figure 2-1 – Island Map

[1] Flood Insurance Study, Volume 1 of 4 – November 5, 2014. FEMA Flood Insurance Study Number: 15003CV001C

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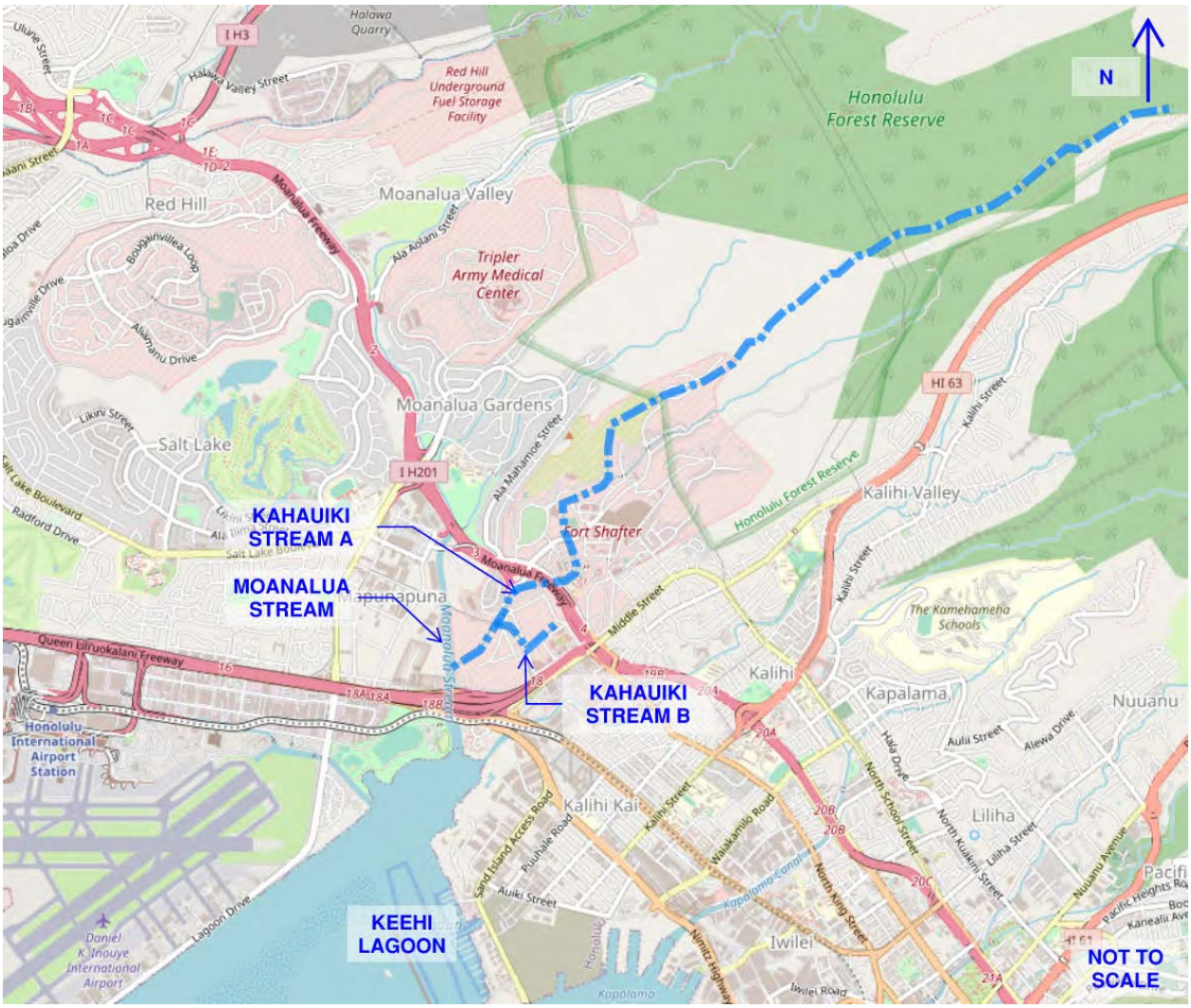

Figure 2-2 – Vicinity Map

The project site is generally located along Kahauiki Stream "A" the southwestern portion of Fort Shafter Flats Installation. In general, the section of Kahauiki Stream "A" included in this study was observed to be in a northeast to southwest orientation and is located near the stream's intersection with Moanalua Stream to the west. The section of Kahauiki Stream "B" included in this study was observed to be in an east to west orientation and is located near the stream's intersection with Kahauiki Stream "A" to the west. The project site is identified as TMK 1-1-008:001 and is owned by the United States of America. See *Figure 2-3 – Kahauiki Stream Project Area* and *Appendix G – Topographic Survey*.

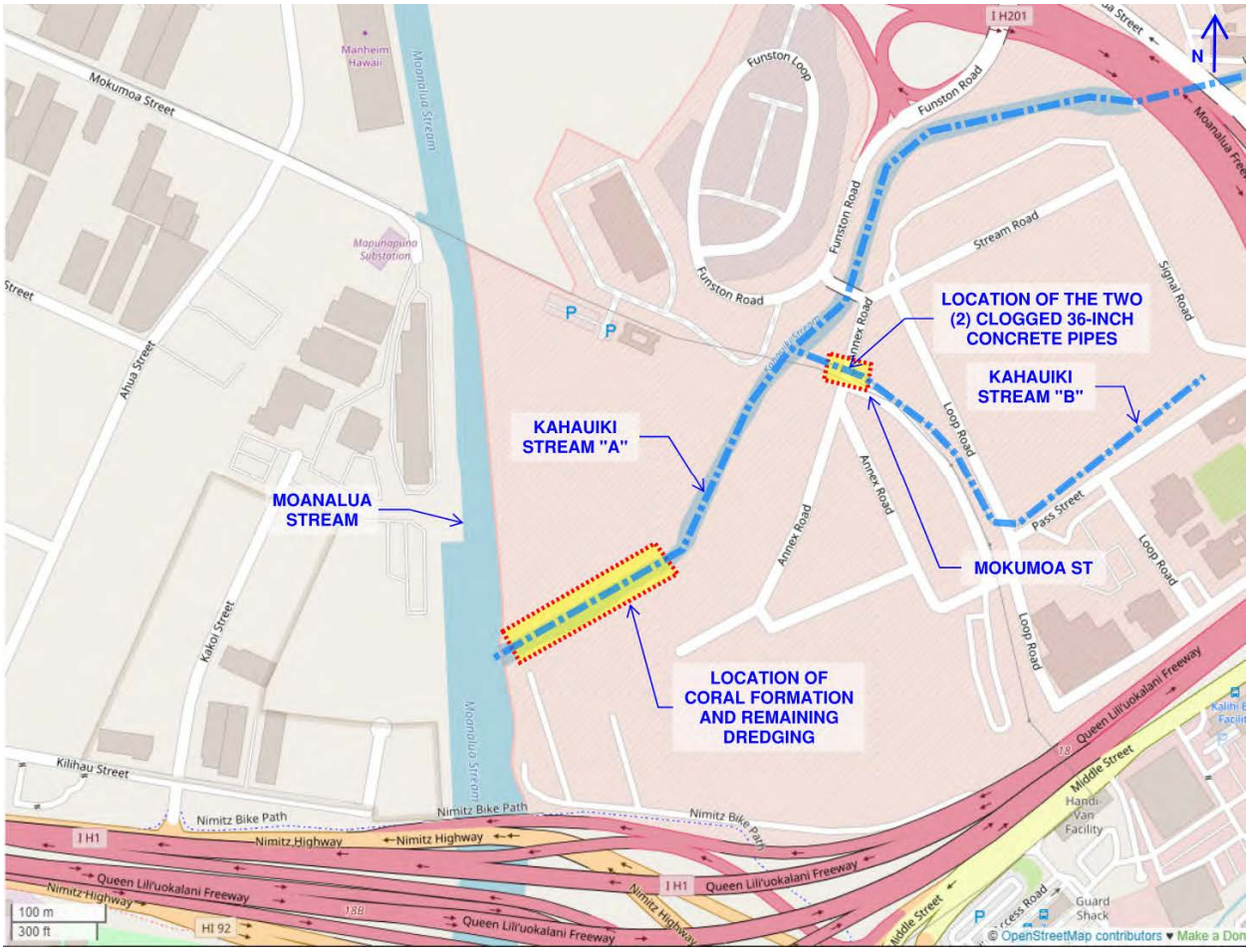

Figure 2-3 – Kahauiki Stream Project Area

The principal cause of flooding of the lower reaches of Kalihi and Moanalua Streams are the restricted capacities of the numerous bridges at the mouths of the streams[2]. In an attempt to mitigate historical flood events, dredging efforts were initiated in 2020, but were not completed due to a number of differing site conditions, including a solid rock formation, and permitting complications. This report has been prepared as part of Contract Number W9128A-22-D-0003, see *Appendix A – Scope of Work, August 2022*.

The project generally involves the dredging and clearing of the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50. See *Appendix D – Approximate Area* where Solid Formation was encountered and *Appendix E – Photographs of Solid Formation*. The project also includes the unblockage or potential repair/replacement of the two (2) 36-inch reinforced concrete drainage pipes located near Kahauiki Stream "B" at station 2+00. This portion of the

[2] Flood Insurance Study, Volume 1 of 4 – November 5, 2014. FEMA Flood Insurance Study Number: 15003CV001C

Attachment G: State Department of Health, Clean Water Branch Section 401

stream passes under Annex Road between Funston Loop and Mokumoa Street. See *Appendix F – Location of Concrete Drainage Pipes*.

The project is divided into two (2) phases: an investigation phase and a design phase. The design phase will be awarded at a later time and it is not part of this scope of work (SOW). The purpose of the investigation phase along Kahauiki Stream "A" is to determine the approximate limits and thickness of the solid formation, identify its material composition, and to provide recommendations for removal down to elevation -5.5 feet Mean Sea Level (MSL). The purpose of the investigation phase along Kahauiki Stream "B" is to assess the two (2) 36-inch reinforced concrete drainage pipes and provide recommendations to unblock the pipes.

ControlPoint Surveying, Inc. prepared a Topographic Survey Map of the area in May 2023; see *Appendix G – Topographic Survey*, dated May 2023 and revised in November 2023. Kokua Geotechnical LLC performed a geotechnical engineering exploration to observe and evaluate the general subsurface conditions to formulate geotechnical recommendations to assist in the design of the project; see *Appendix H – Geotechnical Investigation Report*, dated December 2023.

The authorization for this project is:

- DPW Facilities Engineering Work Order Request (FEWR) #RB000857J, dated 11 August 2022.

2.2 A-E Team

The design team consists of the following consultants:

- Okahara and Associates, Inc. – project management, civil engineering, and landscape architectural services.

  Address: 201 Merchant Street, Suite 1650
  Honolulu, HI 96813

- KAI Hawaii, Inc. – structural engineering services.

  Address: 50 S. Beretania Street, #C-119C
  Honolulu, HI 96813

- Kokua Geotech LLC – geotechnical engineering services.

  Address: 94-974 Pakela Street, Suite 109
  Waipahu, HI 96797

The non-design team consists of the following consultants:

- ControlPoint Surveying, Inc. – topographic surveying, and land mapping services.

  Address: 615 Piikoi Street, Suite 700
  Honolulu, Hawaii 96814

- J. Uno & Associates, Inc. – cost estimating services.

  Address: 1210 Ward Ave, Suite 204
  Honolulu HI 96814

SECTION 3 - CIVIL AND GEOTECHNICAL ENGINEERING SITE INVESTIGATION

3.1 Civil Engineering Scope of Work

1. The civil engineering scope of work for this project is to determine the approximate limits, thickness, and material composition of the solid formation located near Kahauiki Stream "A" from station 1+50 to 5+50. See *Appendix D – Approximate Area where Solid Formation* was encountered and *Appendix E – Photographs of Solid Formation*.

2. The civil engineering scope of work for this project also includes the unblockage or potential repair/replacement of the two (2) 36-inch RCP drainage pipes located near Kahauiki Stream "B" at station 2+00. This portion of the stream passes under Annex Road between Funston Loop and Mokumoa Street. See *Appendix F – Location of Concrete Drainage Pipes*.

3. The Site Engineering Investigation (SEI) report also provides recommendations for removal of the solid formation and unblocking and/or repair or replacement of the two (2) reinforced concrete pipes (RCP) as stated in Items 1 and 2 above.

3.2 References

1. Unified Facilities Criteria (UFC) 3-201-01 Civil Engineering, 20 December 2022.

2. Storm Drainage Standards, Department of Planning and Permitting, City and County of Honolulu, August 2017.

3. Chapter 3 – Rules Relating to Water Quality, Department of Planning and Permitting, Title 20 – City and County of Honolulu Administrative Rules, Amended July 2017.

4. Federal Emergency Management Agency (FEMA) Flood Map Service Center.

3.3 Flood Zone

The Flood Insurance Rate Map (FIRM) shows the project site to be in the floodway area in Zone AE. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood height. The 1% annual flood (100-year flood), also known as the base flood, is

the flood that has a 1% chance of being equaled or exceeded in any given year. See *Figure 3-1 – FEMA Map, Panel 0353G*.

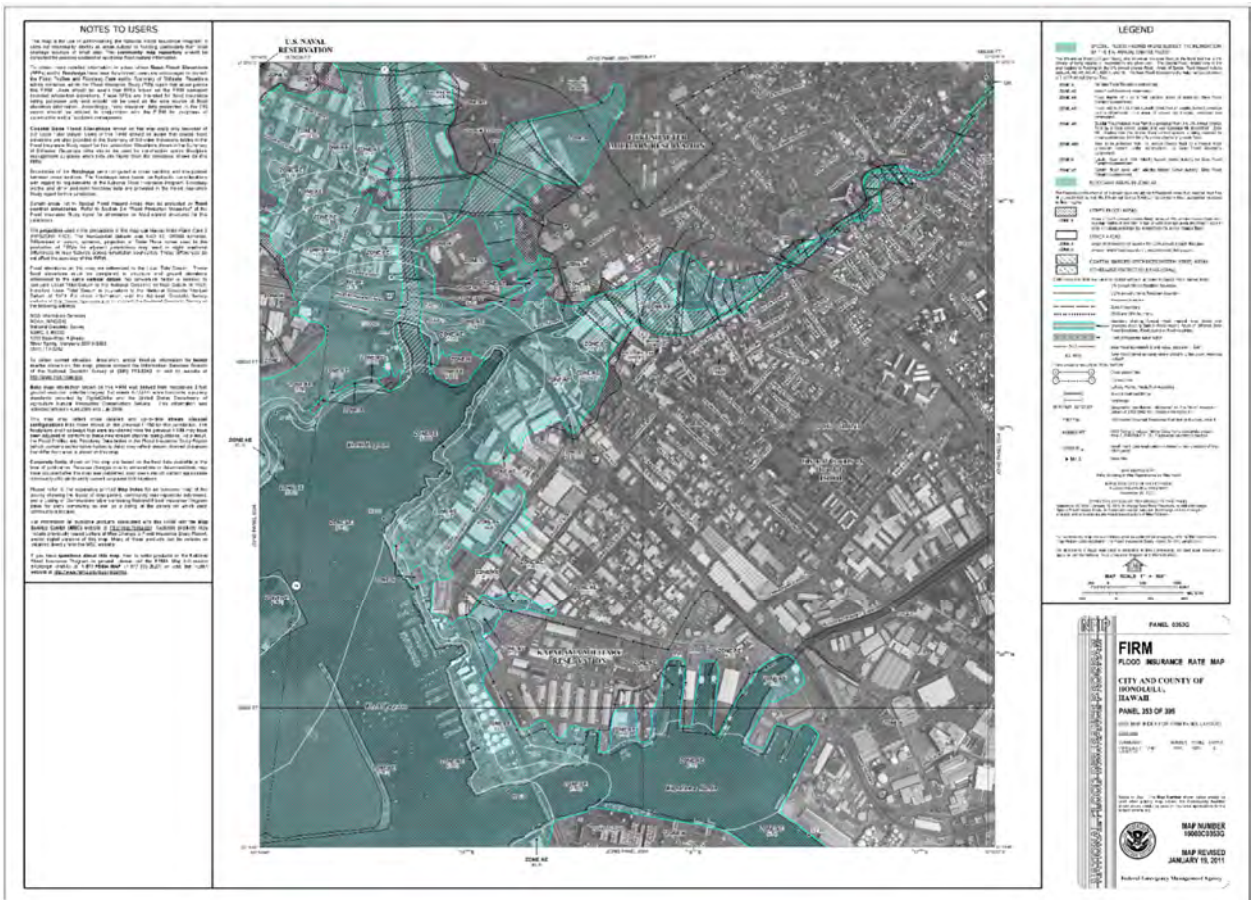

Figure 3-1 – FEMA Map, Panel 0353G

3.4 Existing Site Conditions

1. Okahara and Associates, Inc. (Okahara) visited the site on June 29, 2023 to conduct our site observations concurrently with Kokua Geotech's boring work. At Kahauiki Stream "A", the area where a hard formation was discovered in the channel was visibly shallower and of a different material than surrounding areas. The east bank of the stream exposed what appeared to be a coral rock formation in the same area as where the hard formation was found within the stream bed, see photos below.

Figure 3-2 – Kahauiki Stream "A" looking East.

Figure 3-3 – Kahauiki Stream "A" looking South.

Kokua Geotech explored the subsurface conditions along Kahauiki Stream “A” by drilling and sampling four (4) stream borings extending to depths ranging from about 6.9 to 13 feet below the stream mudline, designated as

Borings Nos. 1 through 4. See *Site Plan – 1* in *Attachment H – Geotechnical Investigation Report* for their locations.

A summary of the coralline detritus in the borings along Kahauiki Stream "A" is presented below.

Table 3.1 – Summary of Coralline Materials Encountered in Borings

Boring No.	Depth to Mudline below Water Surface [feet]	Approximate elevations of Coral Materials [feet MSL]	Approximate Thickness of Coral below Mudline [feet]	Material Composition
1	1.5	-1.5 to -14.5	>13	Very loose to medium dense Silty Sand (SM) with little gravel (coralline detritus)
2	2.4	-2.4 to -7.0	4.6	Loose to medium dense Silty Gravel (GM) with some sand (coralline detritus)
3	3.5	N/A	N/A	No coralline materials encountered
4	3.1	N/A	N/A	No coralline materials encountered

For the approximate lateral extent of the coralline materials exposed along the stream bed encountered in the abovementioned borings, as well as the exposed coralline materials observed along the southern stream bank, see *Site Plan, Plate 2.1* in *Appendix H – Geotechnical Investigation Report*.

Alluvial sediment was found in the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50 and are depicted in orange in *Figure 3-4 – Alluvial Deposit (Kahauiki Stream "A")*.

TMK: 1-1-8: 1
U.S. MILITARY RESERVATION, FORT SHAFTER
UNITED STATES OF AMERICA (FEE OWNER)

KAHAUIKI A 5+50
KAHAUIKI A 4+50
KAHAUIKI A 4+00
KAHAUIKI A 3+50
KAHAUIKI A 3+00
KAHAUIKI A 2+50
KAHAUIKI A 2+00
KAHAUIKI A 1+50
KAHAUIKI A 1+00
0+00
1+00
2+00
3+00
4+00
5+00
6+00
KAHAUIKI STREAM

LEGEND:

- ALLUVIAL DEPOSIT
- EXPOSED CORAL IN STREAM
- EXPOSED CORAL ALONG THE STREAM BANK

PLAN NORTH
TRUE N

40' 0 40' 80'
GRAPHIC SCALE: 1" = 40'

FIGURE 3-4 ALLUVIAL DEPOSIT (KAHAUIKI STREAM A)

SCALE: 1"=40'

Attachment G: State Department of Health, Clean Water Branch Section 401

2. Two (2) existing 36-inch diameter RCP are located near Kahauiki Stream “B” at station 2+00. This portion of the stream passes under Annex Road between Funston Loop and Mokumoa Street. The first pipe is located North and the second is located south; the stormwater flows from east to west. The length of north pipe is approximately 49 feet while the length of the south pipe is approximately 48 feet. The drain pipes are blocked and buried in sediment and are not allowing or greatly restricting flow under Annex Road. See *Appendix F – Location of Concrete Drainage Pipes*.

   Okahara visited the site on June 29, 2023. The two (2) existing 36” RCP culverts under the road were not visible due to the sediment build up and murky water. Water in the channel appeared to be stagnant and not flowing in any direction. Low flow velocity is a contributing factor to sediment building up in this section of the stream and subsequently, blockage of the pipes. The eastern, discharge end of the pipe culverts were slightly overgrown with shrubs and visibly shallow depth of water to stream bed. This is consistent with the grades provided by the surveyor that showed the pipes were completely filled with sediment and the stream bed grade is near the crown of the pipes.

Figure 3-5 – Upstream view of the culverts (Kahauiki Stream "B")

Attachment G: State Department of Health, Clean Water Branch Section 401

Figure 3-6 – Downstream view of the culverts (Kahauiki Stream "B")

KAI Hawaii visited the site on December 20, 2022 to establish the site conditions. See *Section 4.2 Existing Structural Site Conditions* for additional details. An existing sewer line runs parallel to Annex Road and crosses the stream bed.

Kokua Geotech also explored the subsurface conditions along Kahauiki Stream “B” by drilling and sampling one (1) land boring, designated as Boring No. 5. See *Site Plan – 2* in *Attachment H – Geotechnical Investigation Report* for its location.

Groundwater was encountered during the geotechnical field exploration in the boring near Kahauiki Stream “B” (Boring no. 5) at a depth of about 5 feet below the existing ground surface. See *Appendix H – Geotechnical Investigation Report* for additional details.

3.5 Recommended Improvements and Repairs

1. The excavation of the solid formation located near Kahauiki Stream “A” from station 1+50 to 5+50 down to elevation -5.5 feet MSL has been divided into three (3) areas:

- Area 1: exposed coralline material found within the stream bed, depicted in light blue in *Site Plan – 2, Plate 2.1* in *Attachment H – Geotechnical Investigation Report*.
- Area 2: exposed coralline material found along the stream bank, depicted in purple in *Site Plan – 2, Plate 2.1* in *Attachment H – Geotechnical Investigation Report*.
- Area 3: alluvial sediment found in the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50, depicted in orange in *Figure 3-4 – Alluvial Deposit (Kahauiki Stream "A").*

It is anticipated that most of the coralline material at Kahauiki Stream "A" may be excavated with normal heavy excavation equipment. However, excavations encountering boulders and hard coral formation may require the use of hoe rams. It should be noted that coral formations typically contain localized hard and crystallized zones. Therefore, it is anticipated that some difficult excavation conditions may arise in localized areas during construction when the coral formation is encountered.

It is recommended to dredge and clear the remaining section of Kahauiki Stream "A" from station 1+50 to 5+50 to a depth of -5.5 MSL with stream banks sloped 2:1 to existing ground. The total estimated cut quantity is 6,395 cy. The individual cut quantities, separated by areas, are as indicated in the table below:

Table 3.2 – Quantities (Kahauiki Stream "A")

	Cut [cy]
Area 1	1,105
Area 2	210
Area 3	5,080
Total	**6,395**

The typical proposed cross-section of the dredged and cleared stream is shown in *Figure 3-7 – Proposed Improvements (Kahauiki Stream "A")*.

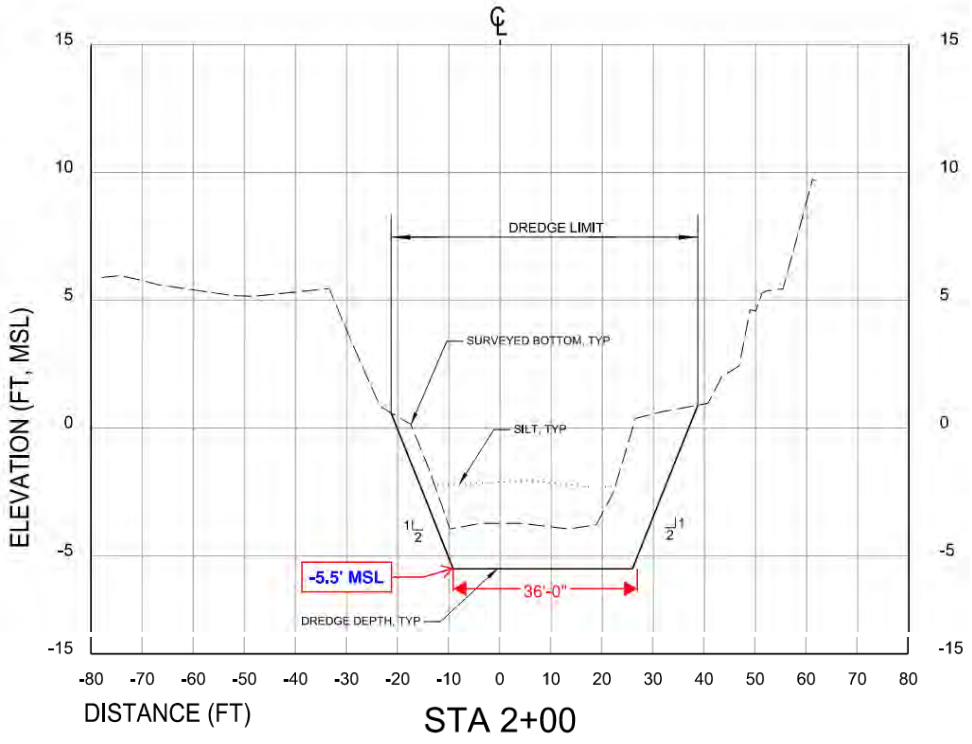

Figure 3-7 – Proposed Improvements[3] (Kahauiki Stream "A")

2. The two (2) existing 36-inch diameter RCP pipes are located near Kahauiki Stream “B” at station 2+00. They are blocked and buried in sediment and do not convey stormwater drainage as intended.

   Structural recommended improvements and repairs of the two (2) 36-inch diameter RCP drainage pipes are listed in *Section 4.5 – Structural Recommended Improvements and Repairs* and are:

   - Dredge the bottom of the stream to remove the accumulated sediment down to the invert of the drain pipes, then clear the pipes of accumulated sediment inside of both drain pipes and remove this displaced sediment and wash water from the stream bed. The recommended method for clearing the sediment is the use of hydro-cleaning jets. If roots or larger rocks are in the pipe, personnel may need to access the pipe to clear those elements.

[3] Image from “ Kahauiki Stream Dredging Plans_RTA_26June2020”

- Have either remote camera-enabled vehicles or a diver go down into the stream to view the drain pipe condition at both ends and the interior if possible.

- Perform repairs, if any, to the drain pipes to create a fully functioning stream system passing under Annex Road while the pipes are in a dry condition while the cofferdam is in place. The types of repairs that we recommend be performed to the existing pipes include spalls or cracks that can be pressure-injected with epoxy. Or spalls at ends of pipe or interior surface can be repaired using a repair mortar with high early strength with a bonding agent applied first at the repair area.

- Conditions that a pipe replacement would be recommended would be a collapse of the pipe or if a full transverse crack for the full circumference of the pipe has occurred.

The total estimated cut quantity to clear the pipes of accumulated sediment inside of both drain pipes is 8.47 cy, of which 4.28 cy is to clear the north pipe and 4.19 cy for the south one. The total estimated cut quantity to dredge the bottom of the Kahauiki Stream "B" in the immediate upstream (east side) and immediate downstream (west side) areas to remove the accumulated sediment down to the invert of the drain pipes is 5.20 cy, of which 3.40 cy is to clear the west side and 1.80 cy is to clear the east side. The table below summarizes the various cut quantities for Kahauiki Stream "B":

Table 3.3 – Quantities (Kahauiki Stream "B")

	Cut [cy]
North Pipe	4.28
South Pipe	4.19
Upstream Area	1.80
Downstream Area	3.40
Total	**13.66**

If the pipe condition assessment indicates that a complete replacement is needed, it is assumed the new drain lines will be installed using conventional open trench (cut-and-cover) methods. This will require an excavation depth of approximately 7 to 8 feet for the installation of the new piping. It is anticipated that soft and/or loose soils will be encountered at or

near the pipe invert elevations. Therefore, it is recommended to provide a subgrade stabilization layer consisting of 18 inches of No. 2 Rock (ASTM C33, No. 4 gradation) or No. 3 Fine Gravel (ASTM C33, No. 67 gradation) wrapped in a non-woven filter fabric below the bedding layer for uniform support.

The typical trench section is shown in the image below:

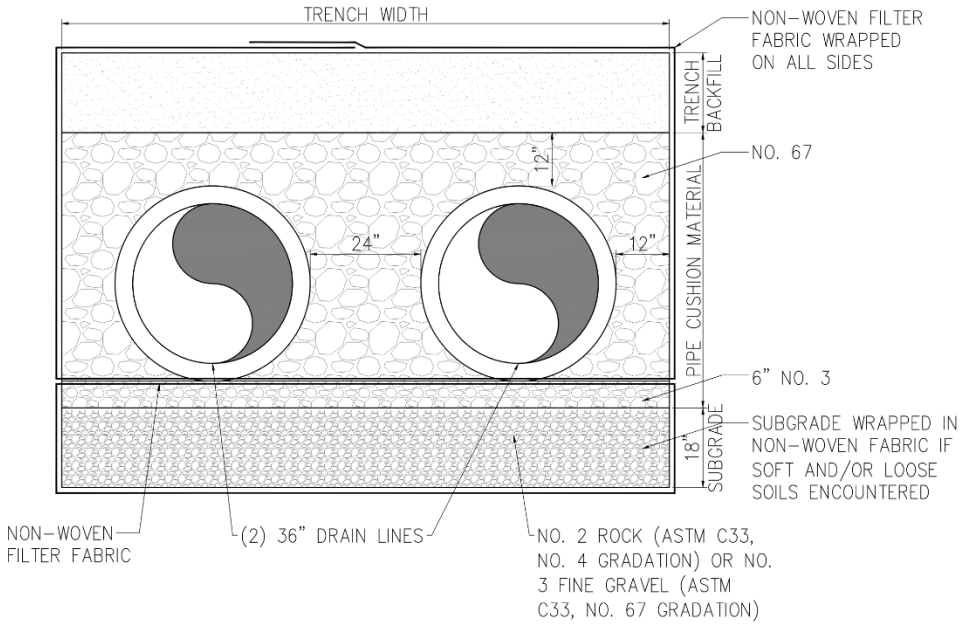

Figure 3-8 – Typical Drain Line Trench (Kahauiki Stream "B")

- Shallow groundwater level was encountered during the geotechnical field investigation and it is anticipated that the new pipes will extend below the groundwater level. Therefore, dewatering of the excavation will be necessary for this installation. See *Appendix H – Geotechnical Investigation Report* for additional discussion.

Although outside the SOW of this project, it is recommended to dredge the downstream portion of Kahauiki Stream “B” up to where it merges with Kahauiki Stream “A” to a depth of -4.6 MSL with stream banks sloped 2:1 to existing ground. The total estimated cut quantity is 195 cy. This is recommended to reduce the amount of sediment immediately downstream and above the invert of the culvert pipes.

Attachment G: State Department of Health, Clean Water Branch Section 401

The typical proposed cross-section of the dredged and cleared stream is shown in *Figure 3-9 – Proposed Improvements (Kahauiki Stream "B")*.

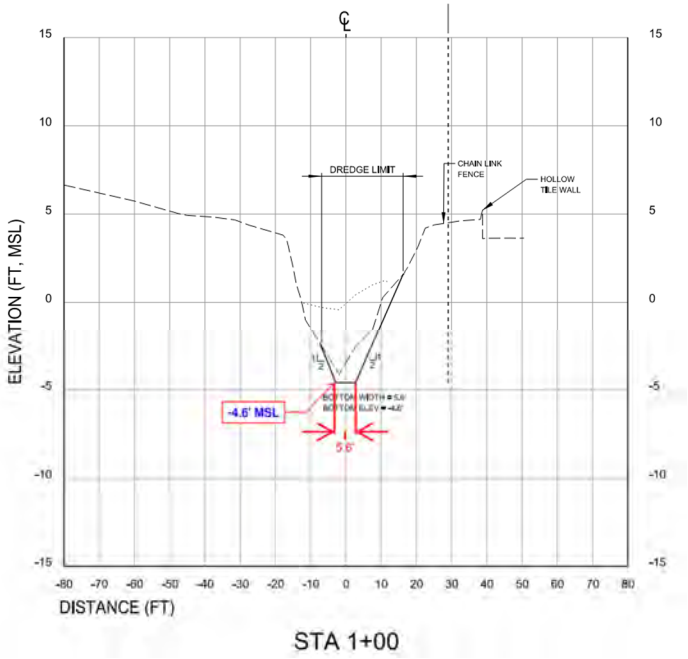

Figure 3-9 – Proposed Improvements[4] (Kahauiki Stream "B")

The total estimated cut quantity to dredge from the downstream (west side) area to the conjunction to Kahauiki Stream “A” in order to remove the accumulated sediment is 195.00 cy.

To conclude, the various cut quantities to dredge and clear Kahauiki Stream “B” are:

Table 3.4 – Quantities (Kahauiki Stream “B”, outside of SOW)

	Cut [cy]
North Pipe	4.28
South Pipe	4.19
Upstream Area	1.80
Downstream Area to Kahauiki Stream “A”	195.00
Total	**205.27**

[4] Image from “ Kahauiki Stream Dredging Plans_RTA_26June2020”

3.6 Permits

1. Kahauiki Stream “A”:
   - An NPDES Permit C – Discharges of storm water associated with construction activities will be needed for the excavation of the solid formation.

   - It is anticipated that a Stream Channel Alteration Permit (SCAP) is required since this project involves permanent activity within the stream bed.

   - Army Corps Section 404 Permit or applicable Nationwide Permit and State of Hawaii Department of Health Section 401 Water quality certification are also anticipated to be needed.

2. Kahauiki Stream “B”:
   - If the dewatering operation involves the discharge of groundwater from the dewatering operation into adjacent systems, an NPDES Permit G – Discharges of construction activity dewatering will be necessary.

   - It is anticipated that a Stream Channel Alteration Permit (SCAP) is required since this project involves permanent activity within the stream bed.

   - Army Corps Section 404 Permit or applicable Nationwide Permit and State of Hawaii Department of Health Section 401 Water quality certification are also anticipated to be needed.

3.7 Photos

1. See *Section 3.4 – Existing Site Conditions* for pictures of the coralline material and the drainage pipes.

2. See *Section 4.3 – Structural Observation of Conditions* for pictures of the coralline material.

3. See *Appendix E – Photographs of solid formation* for pictures of the coralline material.

Attachment G: State Department of Health, Clean Water Branch Section 401

SECTION 4 - STRUCTURAL ENGINEERING SITE INVESTIGATION

4.1 Structural Engineering Scope of Work

Structural assessment for CLIN 0001 at Kahauiki Stream Dredging, Phase 2 includes the assessment of the two 36-inch concrete drain pipes routed under the road crossing the Kahauiki Stream. Part of the assessment will be the conceptual design of repair or replacement of the drain pipes and headwalls.

4.2 Existing Structural Site Conditions

The location of the two existing concrete drain pipes is at the Kahuaiki Stream B portion of the stream as it passes under Annex Road between Funston Loop and Mokumoa Street in the Fort Shafters Flat Installation on Oahu, Hawaii.

4.3 Structural Observation of Conditions

1. Jerry Fujita, a structural engineer from KAI Hawaii visited the site on December 20, 2022 to view the site conditions. One of the objectives was to see if the concrete pipe can be seen below the water surface on either side of the roadway crossing over the two concrete pipes.

2. No part of either pipe could be seen (see Photo No. S-01). Based on reports the pipes have been blocked, not allowing or greatly restricting flow past the Annex Road, it has been reported the stream is prone to flooding during heavy rainfall. This report of flooding is consistent if the drain pipes are blocked not allowing stream flow under the roadway.

Photo No. S-01 East Side of Annex Road at Kahauiki Stream "B"

Attachment G: State Department of Health, Clean Water Branch Section 401

Photo No. S-02 West Side of Annex Road at Kahauiki Stream "B"

3. With the drain pipes not in view and dredging to expose the pipes not permitted at this stage of the project we were limited to a "desk top" assessment of the concrete drain pipes.

4. Based on the "FY 21 Kahauiki Stream Maintenance Dredging Project" drawings on sheet C-106, the invert elevations were noted (see Exhibit 'A').

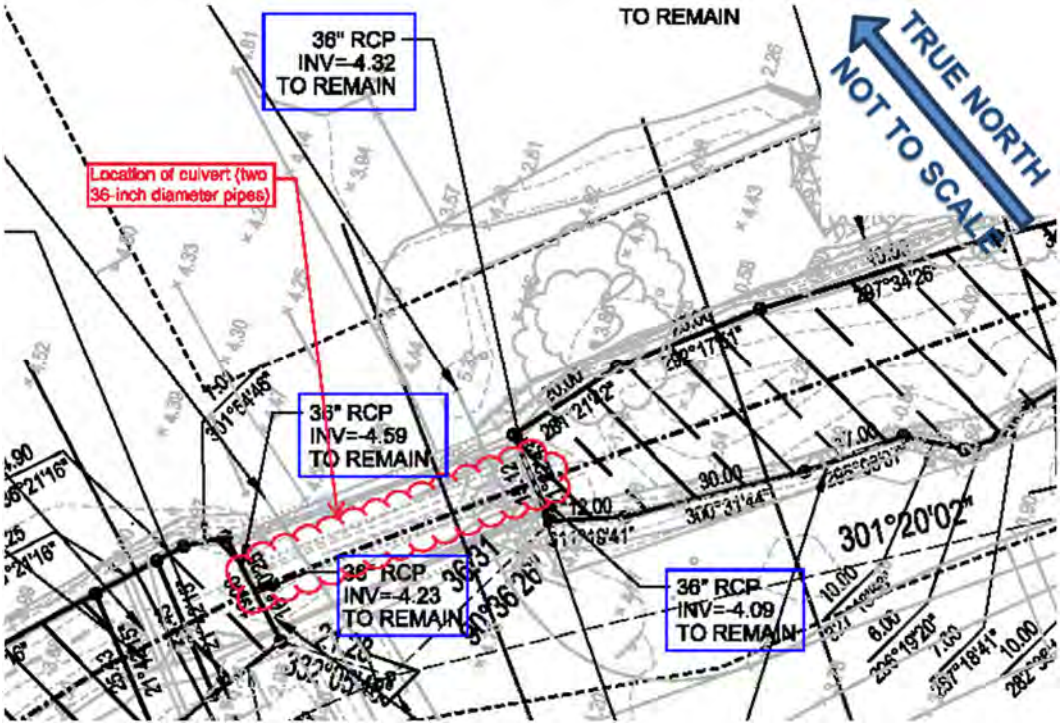

Exhibit 'A': Concrete Drain Pipe Inverts at Annex Road

5. A project topographic survey was conducted as part of the information gathering for this project. The resulting topographic drawings provides the approximate grades of the stream bottom (See Exhibit 'B').

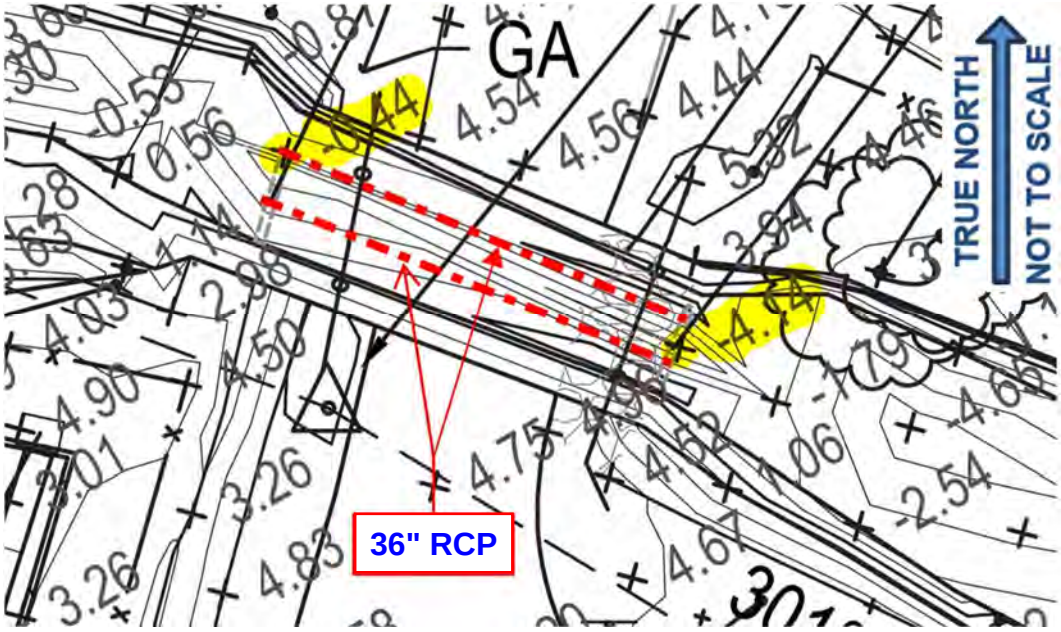

Exhibit 'B': Concrete Drain Pipe with Project Spot Elevations

4.4 Analysis

1. Based on pipe invert elevations on Dredging Project Drawing, the 36-inch drain pipes have the following invert elevations:

   North Pipe
   West End Invert Elevation = -4.59 feet
   East End Invert Elevation = -4.32 feet
   South Pipe
   West End Invert Elevation = -4.23 feet
   East End Invert Elevation = -4.09 feet

2. Project Topographic Grade Elevations at approximate locations of pipe ends:
   West End Invert Elevation = -0.44 feet
   East End Invert Elevation = -4.14 feet

3. Results: based on this data, it is estimated the pipes are buried in sediment for the depth of sediment from the pipe invert:
   West End Sediment Depth = 3.79 feet (1.04 feet over top of pipe)
   East End Sediment Depth = 0.04 feet (just about at the invert)

4. Although it appears the upstream end of the pipes might be exposed in a stream bed depression, with the downstream end buried in about 1 foot of sediment depth over the tops of the pipes, it is very likely these two drain pipes are blocked with sediment for the full volume or very near the full volume of those pipes.

5. The condition of the reinforced concrete pipes (RCP) is unknown due to lack of access, but RCP has a service life upwards of 100 years. So, there's a good chance the pipes are in a service-ready condition, meaning they will require no or just minor repairs to be put back in service after the sediment is cleared from the pipe interiors.

4.5 Structural Recommended Improvements and Repairs

1. Dredge the bottom of the stream to remove the accumulated sediment down to the invert of the drain pipes, then clear the pipes of accumulated sediment inside of both drain pipes and remove this displaced sediment and wash water from the stream bed. The recommended method for clearing the sediment is the use of hydro-cleaning jets. If roots or larger rocks are in the pipe, personnel may need to access the pipe to clear those elements.

2. Have either remote camera-enabled vehicles or a diver go down into the steam to view the drain pipe condition at both ends and the interior if possible.

3. Perform any repairs if any, to the drain pipes to create a fully functioning stream system passing under Annex Road while the pipes are in a dry-condition while the cofferdam is in place. Types of repairs that we recommend be performed to the existing pipes include spalls or cracks that can be pressure-injected with epoxy. Or spalls at ends of pipe or interior surface can be repaired using a repair mortar with high early strength with a bonding agent applied first at the repair area.

4. Conditions that a pipe replacement would be recommended would be a collapse of the pipe or if a full transverse crack for the full circumference of the pipe has occurred.

APPENDIX A

SCOPE OF WORK
AUGUST 2022

Attachment G: State Department of Health, Clean Water Branch Section 401

11 August 2022

A-E Task Order
Scope of Work
For
Kahauiki Stream Maintenance Dredging, Phase 2
Fort Shafter Flats, Oahu, Hawaii

1) **General.** The Architect-Engineer (A-E) shall comply with the terms and conditions set forth in the Statement of Work (SOW) of the proposed basic Indefinite-Delivery Architect-Engineer Services Contract (Civil) for Miscellaneous Projects for the U.S. Army Corps of Engineers (USACE), Honolulu District Area Responsibility, Contract Number W9128A-22-D-0003 and as specified in this Scope of Work.

2) **Authorization.**

A. DPW Facilities Engineering Work Order Request (FEWR) #RB000857J

3) **Budget:** The Estimated Construction Cost (ECC) is $4,500,000. The A-E shall immediately notify the Corps of Engineers, Pacific Ocean Honolulu (POH) Project Manager (PM), Iris Endo, (808)656-2460, if it is determined that the project cannot be constructed within the budget ECC. At this time, the A-E shall identify possible elements for scope reduction or bid items to maintain the project within budget.

4) **Description of Project.**

Kahauiki Stream is a tributary upstream of Ke'ehi Lagoon, located in Honolulu, island of Oahu, Hawaii. Kahauiki Stream is prone to flooding with record of historical flood events. As such, dredging efforts were initiated in 2020 to mitigate flooding but were not completed due to numerous differing site conditions and permitting complications.

A solid formation was encountered during the 2020 dredging. The approximate area of where the solid formation was encountered is shown on ATTACHMENT A.

The purpose of this project is to dredge and clear the remaining section of Kahauiki Stream from STA 1+50 to STA 5+00 (see ATTACHMENT A) and unblock or potentially repair or replace two (2) 36-inch diameter existing concrete drainage pipes located near KAHAUIKI B 2+00 shown on ATTACHMENT B. Photographs of the solid formation are shown in ATTACHMENT C.

5) **Government Furnished Information (GFI).**
   a. Attachment A – Approximate area where solid formation encountered
   b. Attachment B – Location of concrete drainage pipes
   c. Attachment C – Photographs of solid formation
   d. Attachment D – Kahauiki Stream Dredging, Phase 1 plans
   e. Attachment E – Kahauiki Stream Dredging, Phase 1 specs
   f. Attachment F – Topographic Requirements

Attachment G: State Department of Health, Clean Water Branch Section 401

Note: All CAD and/or PDF files are for information only and do not necessarily represent actual as-built conditions. The A-E is responsible for verification of existing conditions.

6) **Work to be Performed.** The work will be split into two (2) phases, an Investigation Phase and a Design Phase (To be awarded at a later date). The purpose of the investigation phase is to determine the approximate limits and thickness of the solid formation and to identify its material composition, and to provide recommendations for removal; assess blockage and condition of existing concrete drainage pipes and provide recommendations to unblock and/or to repair or replace; and develop estimated construction costs for each. The findings and recommendations are to be presented in a Site Engineering Investigation (SEI) Report.

For the design, the A-E will develop plans and specs to dredge and clear the remaining section of Kahauiki Stream from STA 1+50 to STA 5+00 (see ATTACHMENT A) and unblock or potentially repair or replace existing drainage pipes located near KAHAUIKI B 2+00 shown on ATTACHMENT B. **The Design Phase will be awarded as a modification to this contract at a later date.**

The A-E shall furnish all the necessary professional and technical personnel labor, materials, supplies and equipment, mobilization, and transporting to and from the designated work site for the performance of the engineering services as specified herein.

CLIN 0001: Investigation Phase

The A-E shall provide Civil, Surveyor, Structural, Geotechnical, Cost Estimator, and reproduction services.

This Task Order is for the following:

1) Perform a Site Engineering Investigation (SEI) to determine approximate limits and thickness and material composition of a solid formation located near KAHAUIKI A 4+50 (see ATTACHMENT A) and check for blockage of and assess the condition of two (2) 36-inch diameter existing concrete drainage pipes located near KAHAUIKI B 2+00 (see ATTACHMENT B). Provide recommendations for removal of the solid formation down to Elevation -5.5 feet based on Mean Sea Level (MSL) datum and unblocking and/or repair or replacement of the concrete pipes. Develop a construction cost estimate for each.

2) The following services are requested:

- Civil Engineering services to determine the approximate limits, thickness, and material composition of the solid formation located near KAHAUIKI A 4+50 and check for blockage of the existing concrete drainage pipes. Provide recommendations for removal of the solid formation and unblocking and/or repair or replacement of the concrete pipes as stated in Item 1 above.

- Structural Engineering services to assess the condition of the concrete pipes and provide recommendations for repair or replacement, if needed.

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- Surveyor services to perform a topographic survey of the project limits and limits of the solid formation, to determine existing elevations and identify surface features and possible underground utility locations that may affect the dredging and concrete pipe unblocking and/or repairs/replacement.

- Geotechnical Engineering services to provide a Geotechnical Investigation which includes borings to assist with determining the approximate limits, thickness, and material composition of the solid formation and recommendations for removal.

- Cost Engineering services to provide estimated construction costs for removal of the solid formation, unblocking of the concrete pipes, and possible repair or replacement of the concrete pipes.

3) Pre-Design Meeting.

   i. The A-E shall conduct a 1-hour Pre-Design meeting with DPW and POH. The A-E shall also participate in preparation and coordination for the Pre-Design meeting.

   ii. Coordinate with the U.S Army Corps of Engineers Project Manager or designated POC to arrange the specific date, time, and location (physical and/or virtual) of the meeting.

   iii. The A-E shall prepare meeting minutes detailing the scope of work and project issues discussed. Submit meeting minutes via e-mail to the Government Project Manager for review, comment, and approval.

4) On-Board Review (OBR) Attendance. The A-E shall attend an OBR after each submittal to discuss review comments and future actions. The A-E shall coordinate with the POH PM to finalize the date, time, and location (physical and/or virtual) of each OBR. Comments will be managed via DrChecks and shall be reviewed by the A-E prior to the meeting. Responses to the comments with a meeting agenda shall be provided by the AE at least two (2) working days prior to the meeting. An overview of the cost estimate shall be presented. The A-E shall prepare minutes of the OBR and submit to the POH PM within seven calendar days after the conclusion of the OBR. Minutes shall include additional review comments made verbally during the OBR and any decisions reached that are not captured in the existing review comments.

A. Site Engineering Investigation (SEI) Report

1) Prepare a SEI report with approximate limits, thickness, and material composition of the solid formation; recommendations for methods of removal of the solid formation and unblocking and/or repair or replacement of the existing drainage culvert concrete pipes; and associated estimated construction costs for each.

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B. Topographic Survey

1) The A-E shall complete a topographic survey to determine approximate limits of the solid formation, to determine existing elevations and identify surface features and possible underground utility locations that may affect the removal of the solid formation, dredging, and concrete pipe unblocking and/or repairs/replacement. The topographic survey shall also be sufficient to ensure a proper design for CLIN 0002, which will be awarded as a modification to this contract at a later date. The A-E shall confirm the survey limits prior to commencing field work. Utilize available existing survey ground controls or monuments in the project vicinity, established in previous surveys. A minimum of 6 control points shall be referenced for this project. Survey controls will be shown on mapping with proper symbology.

2) Indicate the horizontal and vertical control datum, at least six (6) control stations with three (3) established on or adjacent to each site, date field survey performed, and a survey legend.

3) All horizontal and vertical information will be collected to conform to current National Map Accuracy Standards (NMAS). Horizontal position will be reported accurate to 0.01 feet. DTM (digital terrain model) points should be spaced as such to create equilateral triangles between points within the data set. A rule of thumb for field density is one shot per inch of map scale. For example: a DTM for 1"=10' scale project would dictate a ground shot every 10 feet in the field.

4) Ground control will be established with enough accuracy to support the mapping and requirements. The control will be developed using the Coordinate System referenced below.

5) Provide English engineering survey at a scale of 1"=10' with 1-foot interval contours. Survey may be in AutoCAD V2016 (.dwg). Electronic files shall follow the A/E/C CAD Standard Release 6.0 and A/E/C Graphics Standard Release R2.0, available at https://cadbimcenter.erdc.dren.mil. The CAD/BIM Center Website also has Border Sheets, A/E/C Work Structure, Revit and Civil3d Templates, etc.

6) All surface features within the area to be mapped shall be shown and identified on the 1"=10' mapping. The size, type, and location of all "surface features" for all areas surveyed shall be provided. The phrase "surface features" is intended to include, but is not necessarily limited to, the following:

   a. Locations of all above and below ground utilities shall be shown on the final mapping.

   b. All roads shall have spot elevations at 10 foot intervals along the centerline and each edge of road. The top-back of curbs and gutter flow lines shall be collected for elevation purposes. The back of curb shall be shown in plan view without gutter lines for this mapping. A 1"=1' or 1/2"=1' scale detail shall show each

type of curb encountered in the field. Dimensions of curb height and width shall be annotated on each respective detail. Centerlines will be shown on two-lane roads or wider. The surface type and road name will be shown by text.

c. All permanent buildings, foundations, and structures will be identified. Structures higher than ground elevation shall be collected from their roof lines and shown at zero elevation. This outline will be used to define an obscure zone for eliminating contour display. All buildings and similar structures will have ground elevations determined adjacent to them using the minimum number of points defining the structure's footprint. These elevations shall be 3D line strings to be used as break lines when developing the TIN (triangulated irregular network) for contour processing.

d. All fences, walls and other similar obstructions shall be shown. Chain link fences shall be shown with a double X, rather than a single X as indicated in the CADD standards. Indicate fence height.

e. Show all landscape materials, shrubs, shrub beds, trees over 6" caliper, and types, show limits of turf types (field or lawn), also show irrigation systems. Show all wetlands, wet or marshy areas.

f. Points will be shown on the map by the proper symbol. Designation coordinates and description will be shown by text adjacent to the symbol or in the map margin. Text shall be 3/32ths inch high at 1"=10'scale.

7) Place break lines at all buildings and changes of grade, i.e. road crown, curbing, structures, etc.

8) Show all surface and subsurface utilities. Provide locations and routing of all utilities, to include manhole's top/invert elevations, utility poles, pipe sizes, pipe material, drainage lines, sewer lines, electrical, cable T.V. (CATV) & communication lines and other utility structures, etc. in CADD format. Include next upstream and/or downstream sewer and drain manhole/inlet beyond topographic survey limits. Toning required for all waterlines within the project limits. For all water valves, include top of valve and top of stem; for sewer manholes and cleanouts, include top and inverts of manholes and cleanouts; for drainage structures and swales include top and inverts, and for all electrical, cable T.V. (CATV) & communication line and structures include top of manhole and top and bottom of duct. Utilities shown on the completed survey shall be reviewed for accuracy by appropriate installation personnel prior to submission to the Government.

9) Delineate the following features: Buildings, curbs and gutters, sidewalks, fences, walls, signage, and striping of paved areas. Identify and show locations of all above ground vegetation and trees. Trees with 6-inch in trunk diameter or larger shall be identified to include trunk diameter, height, and spread. The file shall be referenced to NAD 1983 PA11 State Plane Hawaii 3 FIPS 5103 Feet.

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10) Provide spot elevations and top and bottom of curbs and other vertical site structures (e.g. slabs, walls, etc.) at appropriate intervals. Elevations shall be in US Survey Feet and referenced to Mean Sea Level (MSL), Local Tidal Datum, 1983-2001 tidal epoch.

11) All interim and final geospatial data shall include Federal Geographic Data Committee (FGDC) compliant metadata per Executive Order 12906 (April, 1994), as amended by Executive Order 13286 (March, 2003). The metadata will be delivered in Extensible Markup Language (XML) format. XML format metadata can be created using ArcGIS' ArcCatalog software. Tutorials on metadata, are available at http://www.fgdc.gov/metadata.

    If utilizing GIS the A-E shall prepare and submit a geodatabase (Version 10.6 or later) for this project to record all geospatial data. The geodatabase shall be in compliance with the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE version 4.0) and be formatted/stored in accordance with standards developed by the Environmental Systems Research Institute (ESRI). The A-E shall perform a quality control check to ensure its geodatabase is in compliance with the SDSFIE requirements prior to submission of the file. A geodatabase builder and an SDSFIE Compliance Checker are available through the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) web site: https://www.sdsfieonline.org.

    All Geospatial products shall comply with Attachment F.

12) DTM creation. The A-E shall develop and deliver surface models of the survey area using compatible Digital Terrain Modeling software from random spots and breaklines. The digital terrain models shall be developed from the collected data in the survey CAD (2016 Autodesk's Civil 3D and Bentley InRoads DTM) files. Breaklines should include ridges, drainage, road edges, surface water boundaries, and other linear features implying a change in slope. The surface model shall be of adequate density and quality to produce one foot contours derived from the original DTM (Digital Terrain Model) File. The Civil 3D file shall have the coordinate system embedded where each survey point has true coordinates assigned to it while the existing surface provided is in XML format as well as embedded in the file.

13) Provide a digital terrain model (DTM) collected in such a fashion as to support processing as a triangulated irregular network (TIN), and contours generated from the resultant surface. The ground surface should be collected as random spots and with breaklines features suitable for generation of 1 FT contours. Both the random spots and breaklines should be able to be toggled off and on individually.

14) Contours. The contours shall be developed from the digital terrain model (DTM). Each contour shall be drawn sharp and clear as a continuous solid line, dashed contours are not acceptable. Every index contour shall be accentuated as a heavier

line than the intermediate and shall be annotated according to its actual elevation. Labeling or numbering of the contours shall be placed on top of the contour line, so that the elevation is readily discernable, do not break contours. Labeling of intermediate contours may be required in areas of low relief.

15) The coordinates (X, Y, Z) of all topographically significant data points will be recorded. This will include all high and low points, saddle and slope break points, and other points which influence the shape of the mapped surface.

16) All spot elevations supporting visual interpretation of terrain elevation shall be collected and shown on final maps. The elevation value will be displayed as text adjacent to an X (or symbol) placed on the spot elevation position or as text with the decimal point centered over the elevation position. The labeling technique will be noted in the legend. Ground elevations on existing breaks or changes in grades shall be indicated, such as tops of hills, tops, bottoms and flowlines of ditches, saddles and embankment elevations, and any high or low elevations necessary for interpretation. All ground elevations shall be shown to the closest one-tenth of a foot (0.01). All features within the CADD graphics files shall be snappable and shall show proper elevations and coordinates.

17) Show spot elevations at fence corners, property line corners, and at intersections of 10-foot grid system each way.

18) Show joints and spot elevations at joint intersections in all concrete pavements.

19) Include general annotation such as; street names, building numbers, feature descriptions, and surface types. Map features shall be shown by the appropriate symbology.

20) There are two types of continuous breaklines required in this process. This data will have to be placed on the appropriate level.

These are "visible on the map" grade-change lines of planimetric features such as drainage or road centerlines, shorelines, curb lines, pavement edges and other features affecting the surface definition. These lines are required elements in the processing of surface model for contour generation as well as the planimetrics required for the CAD files.

These are "non-visible on the map" break lines, natural breaks or changes in grade of the terrain such as shelves, depressions, ditches, embankment and other slope break lines. These will be collected as three-dimensional line strings for storage. This level will be turned off in the final map. These lines are required elements in the processing of the surface models.

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21) Deliverables. All data products and support files shall be submitted digitally via DoD SAFE. USACE Project Manager will provide a link prior to submission of deliverables.

a. Furnish X, Y, Z, (point code); ASCII file in columnar format include each data point and (point code if used). Each surface shall have an ASCII file.

b. Civil 3D .dwg file and DTM file Digital Terrain model file.

c. DWG (AutoCAD Civil3d) model files and sheet files compliant with A/E/C CAD Standard Release 6.0 downloaded at https://cadbimcenter.erdc.dren.mil

d. Furnish a XML Metadata file which can be generated with a tool from the FGDC website: https://www.usgs.gov/products/data-and-tools/data-management/metadata#tools

C. Geotechnical Investigation

1) **Geotechnical Engineer.** Geotechnical engineering services and report preparation shall be the responsibility of a Civil Engineer licensed and registered in the U.S. or its territories with no less than five (5) years of recent experience in geotechnical engineering, henceforth known as "Geotechnical Engineer."

2) **Geotechnical Exploration.** The A-E shall conduct required site exploration and sampling to characterize the project site. Work items under this task order shall include but not be limited to:

a) The A-E shall obtain all permits including a DPW excavation permit and/or Stream Channel Alteration and/or Diversion Permit as required by federal agencies. Work shall comply with applicable federal, state, and local regulatory requirements and USACE requirements. The A-E shall perform coordination of underground utility toning with all applicable agencies and utility companies (or conduct toning if required).

b) Prior to the conduct of the field geotechnical survey work, prepare and submit a Geotechnical Site Safety and Health Plan (SSHP).

c) The A-E shall submit a proposed boring location plan for review to the Corps of Engineers at least ten (10) working days prior to actual drilling. Perform a total of four (4) borings about 5 to 10 feet below the stream mudline to assist with determining approximate lateral extent, thickness, and material composition of the solid formation for a total of approximately 20 to 40 linear feet of exploration.

d) Provide all drilling and sampling equipment necessary to provide samples for laboratory testing and subsurface condition data for producing the Geotechnical Engineering Report. All soil sampling shall be performed in accordance with the requirements of EM1110-1-1804 dated 01 Jan 01 and shall be conducted in the presence of and/or under direct supervision of the Geotechnical Engineer. Rock

descriptions shall follow EM 1110-1-1804 including, but not limited to, rock type, hardness, weathering, texture, structure, discontinuities, color, void conditions, recovery, and Rock Quality Designation (RQD). The Geotechnical Engineer shall manage the drilling and sampling program.

e) All borings in the stream shall not be backfilled.

f) Provide laboratory testing of selected representative soil samples in classifying the materials and evaluating their engineering properties.

g) Soil samples shall be handled and transported per ASTM standards. All samples shall be stored and protected from undue environment exposure for a minimum of two months following acceptance of the geotechnical report.

h) Discovery of Contaminant Soils: Upon such discovery or find of any contaminant soils (smelly/foul odor/ unknown residue), the A-E shall cease drilling at its present location and immediately notify the Contracting Officer. When so notified, the Contracting Officer will contact a U.S. Army Corps of Engineers (or appropriate) Environmentalist and/or POH Project Manager to determine if contaminants are present and/or modification would take place for required environmental borings and testing in the site area.

Inadvertent Discovery Requirement: The A-E shall take precautions to preserve all historical, archeological, and cultural resources encountered during the work, as they existed at the time they are identified by the Contracting Officer or his designated representative. If previously unidentified or unanticipated resources are inadvertently discovered during excavation, testing or boring, all activities that may damage or alter such resources shall be temporarily suspended. These cultural resources may be prehistoric or historic; surface or subsurface; and include but are not limited to human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, soil or other deposits; rocks or coral alignments, paving, wall, or other constructed features; and any indication of agricultural or other uses. Upon such discovery or find, the A-E shall isolate the material and immediately notify the Contracting Officer. When so notified, the Contracting Officer will contact a U.S. Army Corps of Engineers (or appropriate) Archaeologist to determine if archaeological, historical or cultural resources are present and what procedures will need to be implemented before construction activities can proceed, so that protection of the resources prompt and proper data recover can be accomplished.

3) **Geotechnical Report.** The Geotechnical Report shall include, as a minimum, the following:

a) Cover sheet with the project number and title, location, A-E firm's name, and the date submitted. Final geotechnical report shall be signed and sealed by the Geotechnical Engineer.

b) Project description, statement of the purpose for the geotechnical investigation, and an executive summary of findings.

c) Geologic setting.

d) Summary of the subsurface soil and groundwater conditions encountered at the site.

e) Recommendations regarding approximate limits, thickness, and material composition of the solid formation and recommendations regarding removal, and other geotechnical recommendations that are required to assist in the design of the project.

f) Vicinity reference map indicating the location of the project site.

g) Site Plan showing the drilled boring locations and other sampling locations.

h) Soil boring logs.

i) Results of the field and laboratory testing.

j) The reports will be reviewed by USACE at both Draft and Final Submittal. The A-E shall address DrChecks Geotechnical review comments (in DrChecks) for Draft and Final review comments.

Deliverables – All data products and support files shall be submitted digitally via DoD SAFE. USACE Project Manager will provide a link prior to submission of deliverables.

D. Cost Estimates

The construction cost estimate shall be prepared in accordance with the most current UFC 3-740-05 Handbook: Construction Cost Estimating and AACEI 56R-08 COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE BUILDING AND GENERAL CONSTRUCTION INDUSTRIES.

The level of cost detail shall coincide with the information provided from this investigation. Estimates shall minimize use of lump sum costs. Estimates shall be broken down into major items or features of work based on available information discovered/provided in this investigation to permit analysis of the adequacy of the estimate. The cost estimate shall include a Basis of Cost with supporting documentation for quantity take-offs, crews used, material quotations from suppliers for major features of work (such as piping, structures, etc.), wage rates, and profit calculations. Contingencies may be added based on the level of detail and/or Estimate Class in accordance with AACEI 56R-08. Coordinate with POH Cost Engineering Branch, Kevin Khan, Chief, Cost Engr Branch, (808) 835-4236 or Tracy Kazunaga (808) 835-4330 regarding cost estimate format and to obtain the latest cost data before preparation of initial cost estimate. Micro Computer Aided Cost Engineering System (MCACES), second generation (MII) software shall be used for this project, along with the latest issue of the MII Equipment Library and Cost Book. The MCACES Cost Book (latest edition) database is to be used as a guide and should be tailored to meet project requirements. Cost estimate shall be developed based on submittal documents.

Submit a hardcopy and an electronic file of the estimate and Basis of Cost along with all supporting documentation (i.e., quantity take-off, quotations, wage rates, profit calculations, etc.) for all submittals. Contact Cost Engineering Branch Cost Estimate by email or phone to coordinate transmission of the cost documents. DO NOT SUBMIT THE DETAILED COST ESTIMATES to anyone outside of Cost Engineering Branch. Summary costs without details may be submitted to the Project Manager or Customer as necessary.

Confidentiality: Quantity surveys and cost estimates shall remain the sole property of the Government and shall not be made available to others for any purpose. The disclosure of takeoffs of quantities and costs to prospective bidders or estimators is prohibited. The A-E shall be aware of and take precautionary measures as necessary to maintain the confidential nature of all estimates prepared under this contract. Subcontracting of estimating services is governed by the General Provisions of this contract.

APPENDIX B

OBR MEETING DRAFT SUBMITTAL
OCTOBER 2023

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ON-BOARD REVIEW (OBR) MEETING MINUTES
DRAFT SEI REPORT SUBMITTAL

Project	Kahauiki Stream Maintenance Dredging, Phase 2
Location	Fort Shafter Flats, Island of Oahu, Hawaii
Contract No.	W9128A-22-D-0003 Task Order No. W9128A22F0035
Date and Time	October 17, 2023 – 9:00 a.m. to 10:00 a.m.

TEXT IN BLUE INDICATES ADDITION TO THE AGENDA. See Attachment A – OBR Draft SEI Meeting Agenda.

1. INTRODUCTIONS/ATTENDANCE
   a. Attendance

USACE and Comments Submitters Representatives

		Present?
Iris Endo	Project Manager	Y
Carl Iwasaki	Tech Lead/Geotechnical Engineer, REC	Y
Brendon Hayashi	Structural Engineer, REC	
Alan Kato	Civil Engineer, REC	Y
Ryan Ching	Civil Engineer, Civil Works	Y
Reynaldo Dalmacio	Engineer	
Steven Hardcastle	CAD Manager	
Brysen Calkens	POH Cost Engineer	
Eric Li	POH Cost Engineer	
Kevin Khan	POH Cost Engineer	
Randall Mita	Contracting Officer's Rep.	
Ed Hewitt	DPW, NEPA Coordinator	
Steve Lai	DPW PM	
Jessica Adinolfi	DPW	
Eric Leung	Aqua Engineers	Y
Noah Szenderski	Aqua Engineers	

A/E Project Team

			Present?
Okahara and Associates, Inc.	Charles Jury, P.E.	Principal-in-Charge	
Okahara and Associates, Inc.	Matthew Fujioka, P.E.	PM	Y
Okahara and Associates, Inc.	Irvin Higashi, ALSA	Landscape Architecture	
Okahara and Associates, Inc.	Valentina Forcella, Ph.D., P.E.	Civil Engineering	Y

KAI Hawaii, Inc.	Jerry Fujita, P.E.	Structural Engineering	Y
KAI Hawaii, Inc.	Greg Eng	Structural Engineering	
Kokua Geotech, L.L.C.	A.J. Felkel, P.E.	Geotechnical Engineering	Y
J. Uno & Associates, Inc.	Hector Garcia	Cost Engineering	
J. Uno & Associates, Inc.	Yubin Sol	Cost Engineering	
ControlPoint Surveying, Inc.	Jazfer Guittu	Surveying and Mapping	Y

b. Purpose of this meeting is to discuss selected Dr.Checks comments to conclude with the Client and Government representatives.

2. COMMENTS FOR DISCUSSION:

Comment ID	Comment	Discipline
10447848	Jessica Adinolfi: If tree work is proposed, please schedule for outside of bat pupping season. See Tree Cutting Moratorium attached. Additionally, if greenwaste is generated, handling and disposal must adhere to the attached Greenwaste Policy. If landscaping will be installed as part of project completion, follow the Native Landscaping Policy Memorandum attached. If any fencing will be replaced (i.e., removed and reinstalled rather than left in place), we will need to consult with the U.S. Fish and Wildlife Service for potential impacts to bats. *Okahara Response:* *The scope of work of the current project phase is to provide a site investigation report. Further evaluation of the project impacts to landscape and fence work will be needed during design.* Abovementioned comment will be addressed during the design phase of the project. ACTION ITEM: none at this time and no revisions to the SEI report will be made in response to this comment.	Natural Resources

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Comment ID	Comment	Discipline
10456041	Steve Lai: • For Kahauiki Stream B, we acknowledge your recommended improvements and repairs. However, no mention is made regarding the capacity of the existing drainage system, post FS Flood Mitigation project. Therefore, please verify and ensure existing 36" RCP culverts are sized properly to handle the capacity of a 100 year flood event. The FS Flood Mitigation project is a drainage and pump system facility designed to move flood waters away from the upper portions of FSF during a 100 year flood and uses KSB as an outfall. Since the upstream conditions have changed significantly with the addition of this facility, we want to ensure lower portion of the drainage system and pipes under the road matches the required capacity. This may require changing pipes to larger diameter pipes or changing to a box culvert to meet flow requirements. • Have we considered equalizing the depths of these two streams where they intersect? Please verify the invert of KSA where it intersects KSB matches and that this invert is lower than or equal to the invert of KSB culverts. Our concern is that if the KSA intersection is higher than the invert of KSB outfall, silt would eventually backup into the culverts instead of flowing away downstream along the KSA. *Okahara Response:* *This comment will be discussed during the upcoming OBR meeting.* The current flood study did not encompass observations of the storm drain pipes. ACTION ITEMS: **USACE** to look at the RCP pipes and then coordination with DPW will be initiated. **Okahara** to respond accordingly in ProjNet. No revisions to the SEI report will be made at this time in response to this comment.	Design Analysis

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Comment ID	Comment	Discipline
10465882	Noah Szenderski: Please add the following Sewer Notes: 1. Contractor shall immediately notify the Aqua Engineers, Inc. emergency phone line at (808) 685-7347 of any wastewater spills. 2. Contractor shall be responsible for any sewage spills caused during construction and shall pay for any costs, fines, or penalties associated with any sewage spill resulting from the Work at no cost to the Army or Aqua. Contractor shall remediate any sewage spills as soon as possible. 3. Contractor shall be responsible for any damages to existing sewer utilities caused by the Contractor or any of its subcontractors and shall repair the damaged utilities at no cost to the Army or Aqua. 4. Contractor shall be responsible for maintaining continuous sewer service to all affected areas during construction. 5. Contractor shall notify Aqua 1 week prior to any dredging work near Annex Road and shall also notify Aqua when the dredging work near Annex Road is complete. 6. Contractor shall submit a wastewater spill mitigation plan to Aqua prior to excavation near Annex Road. *Okahara Response:* *These notes do not seem applicable to the SOW that pertains to the Site Engineering Investigation Report for Kahauiki Stream Maintenance Dredging, Ph 2. This comment can be further discussed during the upcoming OBR meeting.* ACTION ITEM: **Okahara** to add a note in the SEI Report that sewer lines are running by the 36-inch culverts.	Utilities Engineering

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- OPEN DISCUSSION
  a. USACE and KAI Hawaii discussed comments 10451591 and 10451594.

Comment ID	Comment	Discipline
10451591	Alan Kato: Item 1 states "clear the pipes of accumulated sediment inside of both drain pipes". Provide recommendations on how to clear the pipes of accumulated sediment. Could this be done with a Vactor Truck with the jet rodder, or some other means. Provide recommended options. ACTION ITEM: **KAI Hawaii** to include in the SEI report detailed description of the recommendations on how to clear the pipes of accumulated sediments. It is anticipated that both ends of the pipes will first need to be dredged due to the sediment built up in order to access the pipes. Due to the location, size, and material of the pipes, hydro-cleaning jets or jet rodding will remove the built-up sediments. Should boulders, roots, or other materials be present, additional equipment may be needed at that time. It is also anticipated that cofferdams created by sand bags around each end of the pipes will be employed to lower the stream water level and capture both the sediment and the washed water during the cleaning process. Turbidity fence might not provide the dry environment needed to accomplish this task. Cleared material will be vacuumed and either left at a designated location on site or hauled off site.	Structural
10451594	Alan Kato: Item 3 states "Perform any repairs, if any to the drain pipes to create a fully functioning stream system". Clarify what type of repairs can be made to the RCP Pipes. Will the area around the pipes have to be dewatered for repairs to be made to the pipes. How much damage would the pipes have to sustain before the pipes should be replaced. ACTION ITEM: **KAI Hawaii** to include in the SEI report detailed description of the recommendations on how to repair the pipes. It is anticipated that once the pipes are cleared, exploration of the pipes can begin. Spalling and crack repairs can be performed by the Contractor from the inside of the pipes. Circumferential	

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Comment ID	Comment	Discipline
	cracks or cave in of the pipes will require the replacement of the RCP. USACE asked when it would be more economical to replace the RCP vs when to repair them. KAI Hawaii stated that replacement will be necessary if there is collapse or failure within the pipe or if there are circumferential cracks that go completely around the pipe. Repairs for other damage such as cracking and spalling, can be made within the 36" pipes as the area will be dewatered and the pipes cleared of sediment prior to repair work commencing.	

b. USACE and ControlPoint discussed comment 10405089.

Comment ID	Comment	Discipline
10405089	Ryan Ching: Please verify the extents of the coral reef. Based on photos it appears the coral reef is more expansive than what is shown on sheet 1. Discussion: This comment was made prior to the Geotechnical Exploration Report being available. The Geotechnical exploration report was included in the Draft SEI Report and it shows the extent of the coral reef. ACTION ITEM: **ControlPoint** to field verify the extent of the coral reef at the next site visit and revised the mapping.	General (Plans)

c. USACE agreed with the responses provided by the A-E Team on ProjNet to the remaining comments.

d. USACE mentioned that coordination between DPW - Clean Water Branch and the design team will be needed during the design phase of this project if it follows the investigation phase. The dewatering method employed in phase 1 is not the preferred one to be used during the construction phase of the Kahauiki Stream Maintenance dredging, phase 2. ACTION ITEM: The **A-E Team** to meet with DPW – Clean Water Branch during the design phase of this project if it follows the investigation phase.

e. USACE stated that the Draft SEI Report was reviewed by the Environmental branch and no comments were made for the A-E Team to address.

f. Feedback from DPW will be solicited during the design phase of this project if it follows the investigation phase.

Attachment G: State Department of Health, Clean Water Branch Section 401

- UPCOMING SCHEDULE: no comments were provided on the upcoming submittals and review period.
  a. Final SEI Submittal: 7 November 2023
  b. Government Review period ends on 14 November 2023
  c. OBR meeting: 21 November 2023
  d. Backcheck Submittal: 5 December 2023
  e. Government Review period ends on 12 December 2023
  f. Complete Submittal: 19 December 2023

Attachment G: State Department of Health, Clean Water Branch Section 401

Attachment A – OBR Conceptual Meeting Agenda

Attachment G: State Department of Health, Clean Water Branch Section 401

Okahara and Associates, Inc.
ENGINEERS AND LANDSCAPE ARCHITECTS

ON-BOARD REVIEW (OBR) MEETING AGENDA
DRAFT SEI REPORT SUBMITTAL

Project	Kahauiki Stream Maintenance Dredging, Phase 2
Location	Fort Shafter Flats, Island of Oahu, Hawaii
Contract No.	W9128A-22-D-0003 Task Order No. W9128A22F0035
Date and Time	October 17, 2023 – 9:00 a.m. to 10:00 a.m.

1. INTRODUCTIONS/ATTENDANCE
   a. Attendance

USACE and Comments Submitters Representatives

Iris Endo	Project Manager
Carl Iwasaki	Tech Lead/Geotechnical Engineer, REC
Brendon Hayashi	Structural Engineer, REC
Alan Kato	Civil Engineer, REC
Ryan Ching	Civil Engineer, Civil Works
Reynaldo Dalmacio	Engineer
Steven Hardcastle	CAD Manager
Brysen Calkens	POH Cost Engineer
Eric Li	POH Cost Engineer
Kevin Khan	POH Cost Engineer
Randall Mita	Contracting Officer's Rep.
Ed Hewitt	DPW, NEPA Coordinator
Steve Lai	DPW PM
Jessica Adinolfi	DPW
Noah Szenderski	Aqua Engineers

A/E Project Team

Okahara and Associates, Inc.	Charles Jury, P.E.	Principal-in-Charge
Okahara and Associates, Inc.	Matthew Fujioka, P.E.	PM
Okahara and Associates, Inc.	Irvin Higashi, ALSA	Landscape Architecture
Okahara and Associates, Inc.	Valentina Forcella, Ph.D., P.E.	Civil Engineering
KAI Hawaii, Inc.	Jerry Fujita, P.E.	Structural Engineering
KAI Hawaii, Inc.	Greg Eng	Structural Engineering
Kokua Geotech, L.L.C.	A.J. Felkel, P.E.	Geotechnical Engineering
J. Uno & Associates, Inc.	Yubin Sol	Cost Engineering
J. Uno & Associates, Inc.	Hector Garcia	Cost Engineering

   b. Purpose of this meeting is to discuss selected Dr.Checks comments to conclude with the Client and Government representatives.

2. COMMENTS FOR DISCUSSION:

Comment ID	Comment	Discipline
10447848	Jessica Adinolfi: If tree work is proposed, please schedule for outside of bat pupping season. See Tree Cutting Moratorium attached. Additionally, if greenwaste is generated, handling and disposal must adhere to the attached Greenwaste Policy. If landscaping will be installed as part of project completion, follow the Native Landscaping Policy Memorandum attached. If any fencing will be replaced (i.e., removed and reinstalled rather than left in place), we will need to consult with the U.S. Fish and Wildlife Service for potential impacts to bats. *Okahara Response:* *The scope of work of the current project phase is to provide a site investigation report . Further evaluation of the project impacts to landscape and fence work will be needed during design.*	Natural Resources
10456041	Steve Lai: 1. For Kahauiki Stream B, we acknowledge your recommended improvements and repairs. However, no mention is made regarding the capacity of the existing drainage system, post FS Flood Mitigation project. Therefore, please verify and ensure existing 36" RCP culverts are sized properly to handle the capacity of a 100 year flood event. The FS Flood Mitigation project is a drainage and pump system facility designed to move flood waters away from the upper portions of FSF during a 100 year flood and uses KSB as an outfall. Since the upstream conditions have changed significantly with the addition of this facility, we want to ensure lower portion of the drainage system and pipes under the road matches the required capacity. This may require changing pipes to larger diameter pipes or changing to a box culvert to meet flow requirements.	Design Analysis

Attachment G: State Department of Health, Clean Water Branch Section 401

Comment ID	Comment	Discipline
	2. Have we considered equalizing the depths of these two streams where they intersect? Please verify the invert of KSA where it intersects KSB matches and that this invert is lower than or equal to the invert of KSB culverts. Our concern is that if the KSA intersection is higher than the invert of KSB outfall, silt would eventually backup into the culverts instead of flowing away downstream along the KSA. *Okahara Response:* *This comment will be discussed during the upcoming OBR meeting.*	
10465882	Noah Szenderski: Please add the following Sewer Notes: 1. Contractor shall immediately notify the Aqua Engineers, Inc. emergency phone line at (808) 685-7347 of any wastewater spills. 2. Contractor shall be responsible for any sewage spills caused during construction and shall pay for any costs, fines, or penalties associated with any sewage spill resulting from the Work at no cost to the Army or Aqua. Contractor shall remediate any sewage spills as soon as possible. 3. Contractor shall be responsible for any damages to existing sewer utilities caused by the Contractor or any of its subcontractors and shall repair the damaged utilities at no cost to the Army or Aqua. 4. Contractor shall be responsible for maintaining continuous sewer service to all affected areas during construction. 5. Contractor shall notify Aqua 1 week prior to any dredging work near Annex Road and shall also notify Aqua when the dredging work near Annex Road is complete. 6. Contractor shall submit a wastewater spill mitigation plan to Aqua prior to excavation near Annex Road. *Okahara Response:* *These notes do not seem applicable to the SOW that pertains to the Site Engineering Investigation Report*	Utilities Engineering

Attachment G: State Department of Health, Clean Water Branch Section 401

Comment ID	Comment	Discipline
	for Kahauiki Stream Maintenance Dredging, Ph 2. This comment can be further discussed during the upcoming OBR meeting.	

3. OPEN DISCUSSION

4. UPCOMING SCHEDULE
   a. Final SEI Submittal: 7 November 2023
   b. Government Review period ends on 14 November 2023
   c. OBR meeting: 21 November 2023
   d. Backcheck Submittal: 5 December 2023
   e. Government Review period ends on 12 December 2023
   f. Complete Submittal: 19 December 2023

Attachment G: State Department of Health, Clean Water Branch Section 401

APPENDIX C

OBR MEETING FINAL SUBMITTAL
NOVEMBER 2023

Attachment G: State Department of Health, Clean Water Branch Section 401

Okahara and Associates, Inc.
ENGINEERS AND LANDSCAPE ARCHITECTS

ON-BOARD REVIEW (OBR) MEETING AGENDA
FINAL SEI REPORT SUBMITTAL

Project	Kahauiki Stream Maintenance Dredging, Phase 2
Location	Fort Shafter Flats, Island of Oahu, Hawaii
Contract No.	W9128A-22-D-0003 Task Order No. W9128A22F0035
Date and Time	December 4, 2023 – 11:00 a.m. to 12:00 p.m.

1. INTRODUCTIONS/ATTENDANCE
   a. Attendance

USACE and Comments Submitters Representatives

Iris Endo	Project Manager
Carl Iwasaki	Tech Lead/Geotechnical Engineer, REC
Brendon Hayashi	Structural Engineer, REC
Alan Kato	Civil Engineer, REC
Ryan Ching	Civil Engineer, Civil Works
Reynaldo Dalmacio	Engineer
Steven Hardcastle	CAD Manager
Brysen Calkens	POH Cost Engineer
Eric Li	POH Cost Engineer
Kevin Khan	POH Cost Engineer
Randall Mita	Contracting Officer's Rep.
Ed Hewitt	DPW, NEPA Coordinator
Steve Lai	DPW PM
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Okahara and Associates, Inc.	Valentina Forcella, Ph.D., P.E.	Civil Engineering
KAI Hawaii, Inc.	Jerry Fujita, P.E.	Structural Engineering
KAI Hawaii, Inc.	Greg Eng	Structural Engineering
Kokua Geotech, L.L.C.	A.J. Felkel, P.E.	Geotechnical Engineering
J. Uno & Associates, Inc.	Yubin Sol	Cost Engineering
J. Uno & Associates, Inc.	Hector Garcia	Cost Engineering

   b. Purpose of this meeting is to discuss selected Dr.Checks comments to conclude with the Client and Government representatives.

2. COMMENTS FOR DISCUSSION:

Comment ID	Comment	Discipline
10451589	Alan Kato: Exhibit A – Concrete Drain Pipe Inverts at Annex Road, page 28 Add North Arrow and Graphic Scale or indicate "Not to Scale" *Okahara Response:* Exhibit revised to add North Arrow and "not to scale" in formatting consistent with other maps in the report. Attached updated map to Dr Checks response.	Structural
10451590	Alan Kato: Exhibit – Concrete Drain Pipe with Project Spot Elevations, page 29 Add North Arrow and Graphic Scale or indicate "Not to Scale" *Okahara Response:* Exhibit revised to add North Arrow and "not to scale" in formatting consistent with other maps in the report. Attached updated map to Dr Checks response.	Structural

3. OPEN DISCUSSION
    a. What is included in the cost of Dredging of Kahauiki Stream B.
    b. Additional Comments from Ryan Ching.
        i. Add Kahauiki Stream Stationing to Figure 3.4, V101, V102. And Geotechnical Site Exhibits.

4. UPCOMING SCHEDULE
    a. Backcheck Submittal: 5 December 2023
    b. Government Review period ends on 12 December 2023
    c. Complete Submittal: 19 December 2023

Attachment G: State Department of Health, Clean Water Branch Section 401

APPENDIX D

APPROXIMATE AREA WHERE SOLID FORMATION ENCOUNTERED

Attachment G: State Department of Health, Clean Water Branch Section 401

US Army Corps of Engineers®
HONOLULU DISTRICT

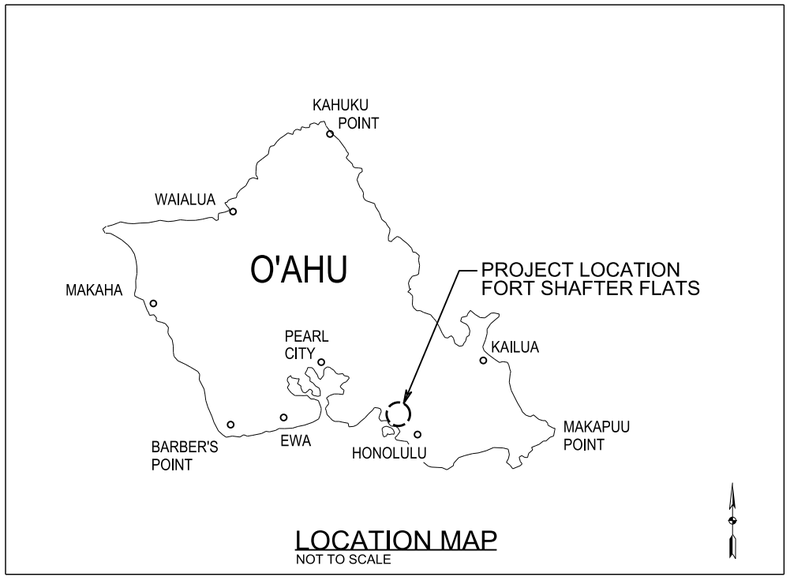
ORIGINAL SIZE = 34"X22"

FY21 KAHAUKI STREAM MAINTENANCE DREDGING FORT SHAFTER FLATS, ISLAND OF OAHU

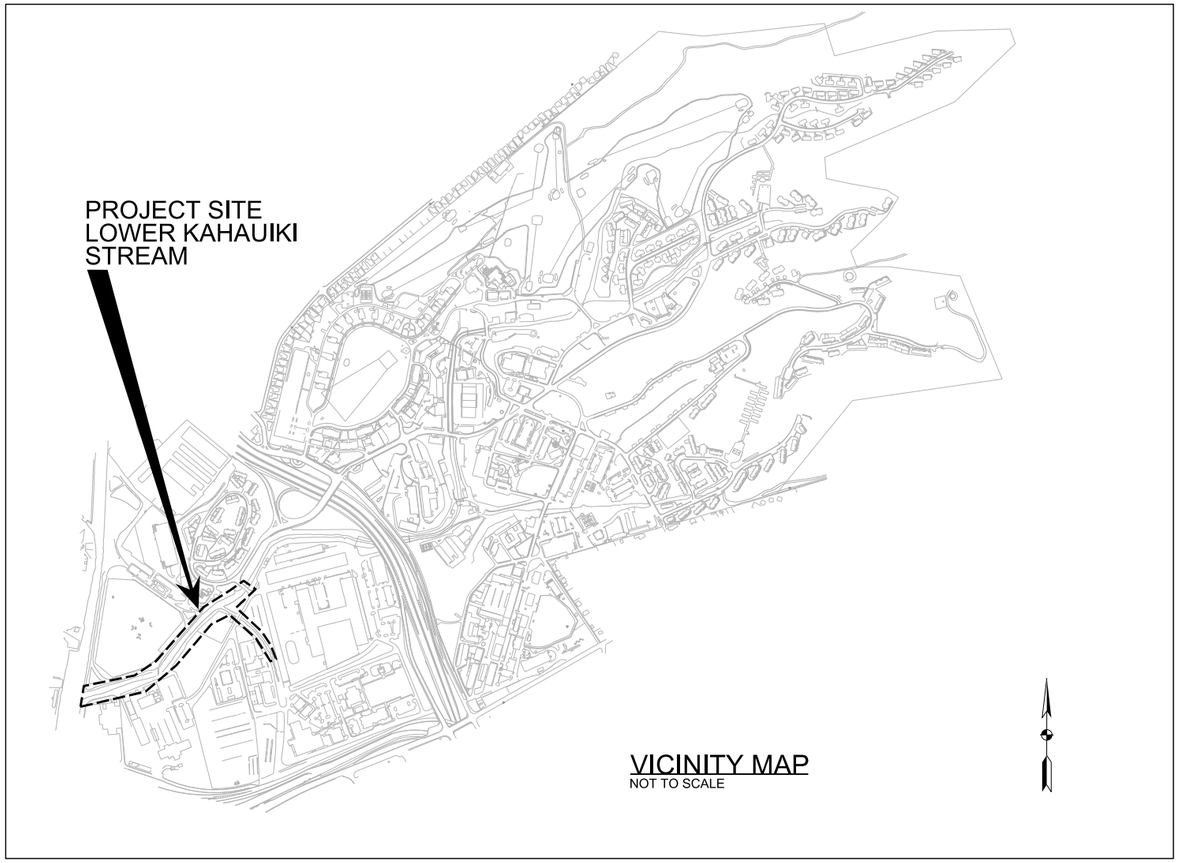
INDEX TO DRAWINGS

DRAWING LIST

DESIGN FILE	SHEET NUMBER	DESCRIPTION
		GENERAL
19fs03_G-001.DGN	G-001	COVERSHEET & SHEET INDEX
19fs03_G-002.DGN	G-002	GENERAL NOTES, SURVEY NOTES, ABREVIATIONS, AND LEGEND
19fs03_G-003.DGN	GC101	SITE PLAN - DEWATERING, COSA AND HAUL ROUTE
		CIVIL
19fs03_C-101.DGN	C-101	CHANNEL LAYOUT PLAN
19fs03_C-102.DGN	C-102	OVERALL SITE PLAN AND SURVEY NOTES
19fs03_C-103.DGN	C-103	SURVEY PLAN KAHAUIKI A STA 0+00 - STA 5+50
19fs03_C-104.DGN	C-104	SURVEY PLAN KAHAUIKI A STA 5+50 - STA 11+00
19fs03_C-105.DGN	C-105	SURVEY PLAN KAHAUIKI A STA 11+00 - STA 16+00
19fs03_C-106.DGN	C-106	SURVEY PLAN KAHAUIKI A STA 16+00 - STA 18+60 AND KAHAUIKI B (TRIBUTARY) STA 0+00 - STA 3+50
19fs03_C-107.DGN	C-107	EROSION CONTROL PLAN
19fs03_C-301.DGN	C-301	KAHAUIKI A CROSS SECTIONS STA 1+50 - STA 3+00
19fs03_C-302.DGN	C-302	KAHAUIKI A CROSS SECTIONS STA 3+50 - STA 5+00
19fs03_C-303.DGN	C-303	KAHAUIKI A CROSS SECTIONS STA 5+50 - STA 7+00
19fs03_C-304.DGN	C-304	KAHAUIKI A CROSS SECTIONS STA 7+50 - STA 8+25
19fs03_C-305.DGN	C-305	KAHAUIKI A CROSS SECTIONS STA 8+50 - STA 9+50
19fs03_C-306.DGN	C-306	KAHAUIKI A CROSS SECTIONS STA 10+00 - STA 11+50
19fs03_C-307.DGN	C-307	KAHAUIKI A CROSS SECTIONS STA 12+00 - STA 13+50
19fs03_C-308.DGN	C-308	KAHAUIKI A CROSS SECTIONS STA 14+00 - STA 15+50
19fs03_C-309.DGN	C-309	KAHAUIKI A CROSS SECTIONS STA 15+75 - STA 17+00
19fs03_C-310.DGN	C-310	KAHAUIKI A CROSS SECTIONS STA 17+50 - STA 18+25
19fs03_C-311.DGN	C-311	KAHAUIKI A CROSS SECTIONS STA 18+50 - STA 18+60
19fs03_C-312.DGN	C-312	KAHAUIKI B CROSS SECTIONS STA 2+15 - STA 3+50
19fs03_C-313.DGN	C-313	KAHAUIKI B CROSS SECTIONS STA 2+15 - STA 3+50
19fs03_C-501.DGN	C-501	EROSION CONTROL DETAILS



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

This project was designed by the Honolulu District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 26 JUNE 2020
SOLICITATION NO.:
CONTRACT NO.:
RTA SUBMITTAL

DESIGNED BY: TS
DRAWN BY: CP
CHECKED BY: LM
SUBMITTED BY:
SIZE: 34X22
FILE NUMBER

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU, HAWAII

CIVIL WORKS TECHNICAL BRANCH

FY21 KAHAUIKI STREAM MAINTENANCE DREDGING
FORT SHAFTER FLATS, ISLAND OF OAHU

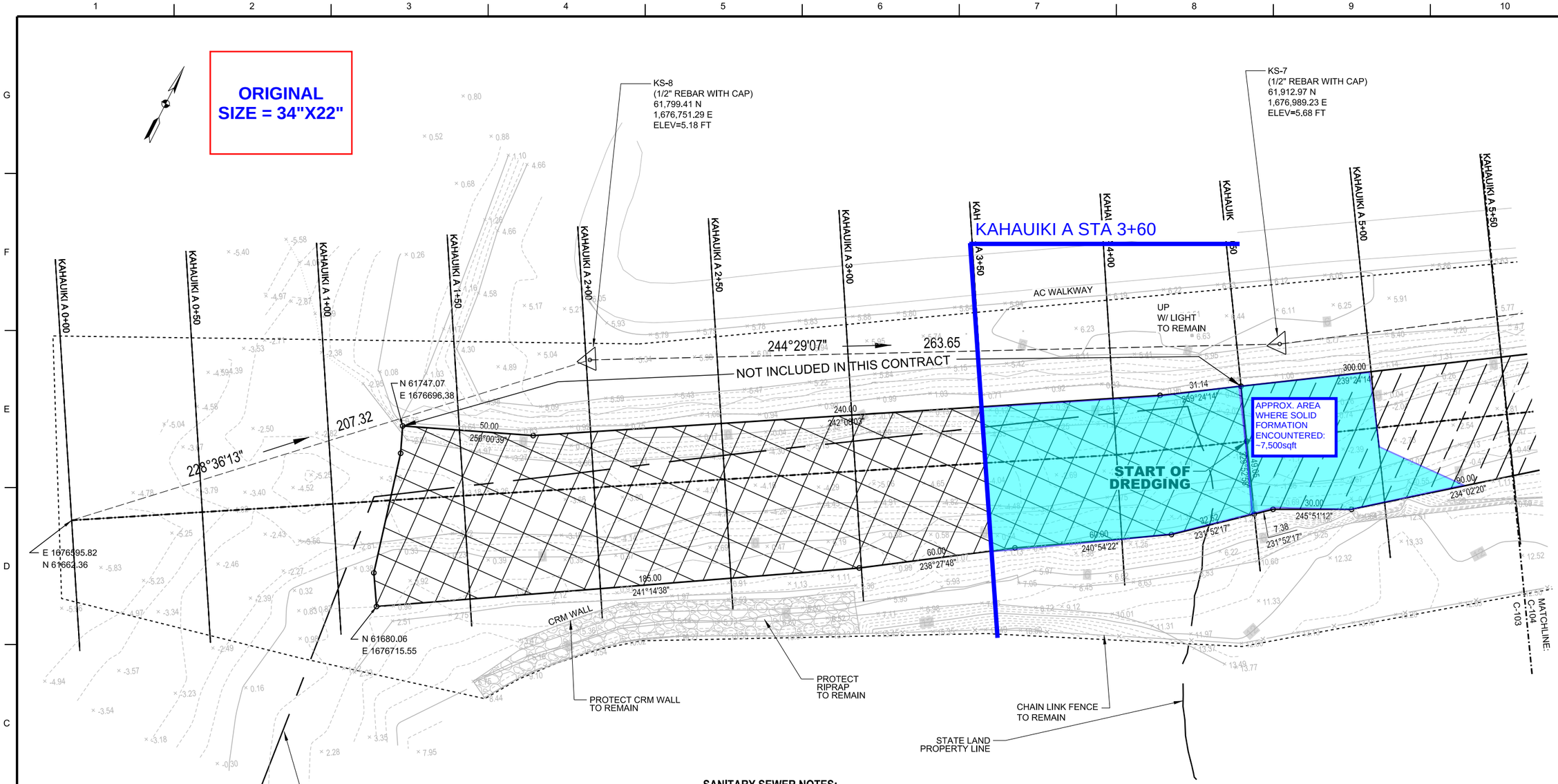
COVER SHEET
LOCATION & VICINITY MAPS, SHEET INDEX

SHEET ID
G-001

Attachment G: State Department of Health, Clean Water Branch Section 401

DESIGN COMPLETE

ORIGINAL SIZE = 34"X22"



LEGEND:

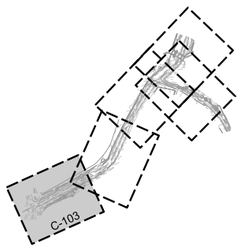
- DREDGE AREA / LIMIT
- NOT INCLUDED IN THIS CONTRACT
- PROJECT LIMIT

SANITARY SEWER NOTES:

1. THE CONTRACTOR SHALL MAINTAIN A MINIMUM CLEARANCE OF 5' FROM THE CENTER OF ANY EXISTING SEWERLINE.
2. BEGINNING FROM THE MINIMUM 5' CLEARANCE, THE CONTRACTOR SHALL TAPER THE EXCAVATION OUTWARDS, AWAY FROM THE SEWER LINE, SO THAT THE SEWER LINE WILL REMAIN SUPPORTED AND STRUCTURALLY SOUND.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY AQUA ENGINEERS, INC. AT (808) 685-7347 IN THE EVENT OF ANY WASTEWATER SPILL.
5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY DPW SPILL LINE OF ALL SPILLS (INCLUDING WASTEWATER), DURING BUSINESS HOURS: 656-1111, AFTER HOURS (IOC) 656-3272.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION, INCLUDING ANY FINES AND/OR PENALTIES DUE TO ANY SPILL RESULTING FROM THE WORK.

NOTES:

1. HORIZONTAL COORDINATES AND AZIMUTHS ARE REFERENCED TO HAWAII STATE PLANE, ZONE 3, NAD 83 (PA11), EPOCH 2010 U.S. SURVEY FEET. AZIMUTHS ARE MEASURED CLOCKWISE FROM TRUE SOUTH.
2. ELEVATIONS ARE REFERENCED TO SHAFT BOLT, A 3/4 INCH BRASS PIN (PUBLISHED THROUGH NATIONAL GEODETIC SURVEY), ELEVATION=46.50 FEET, MEAN SEA LEVEL, 1983-2001 TIDAL EPOCH, U.S. SURVEY FEET.
3. FIELD SURVEY WORK HAS BEEN CONDUCTED BY SAM O. HIROTA, INC. ON NOVEMBER 15, 2018 - JANUARY 2, 2019.
4. BATHYMETRY SPOT ELEVATIONS WERE SURVEYED BY USING A FIBERGLASS ATOMIC ROD (BOTTOM OF ROD BEING APPROXIMATELY 2 INCHES IN DIAMETER). THE ATOMIC ROD WAS USED TO LOCATE THE EXISTING GROUND AND SILT IN CERTAIN AREAS. IN THE FIELD, SILT IS DEFINED AS A SOFT UNDERWATER MUD THAT WAS EASILY PENETRATED BY ATOMIC ROD TO LOCATE THE EXISTING GROUND.
5. UTILITY LINE BETWEEN UTILITY POLES PRESENT AN OVERHEAD HAZARD AT ABOUT 15-20 FEET ABOVE GROUND.
6. TREES OUTSIDE OFTHE DREDGE LIMITS ARE NOT TO BE TRIMMED, CUT DOWN OR REMOVED.
7. MAINTAIN A 3 FOOT MINIMUM SETBACK DISTANCE FROM EXISTING STRUCTURES.



KEY PLAN
NTS

SITE PLAN KAHAUIKI A STA 0+00 - STA 5+50

0 20' 40'
SCALE: 1"=20'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: TS	ISSUE DATE: 26 JUNE 2020
DRAWN BY: CP	SOLICITATION NO.:
CHECKED BY: LM	CONTRACT NO.:
SUBMITTED BY: LM	RTA SUBMITTAL
SIZE: 34X22	FILE NUMBER

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU, HAWAII

CIVIL WORKS TECHNICAL BRANCH

FY21 KAHAUIKI STREAM MAINTENANCE DREDGING
FORT SHAFTER FLATS, ISLAND OF OAHU

SITE PLAN KAHAUIKI A
STA 0+00 - STA 5+50

SHEET ID
C-103

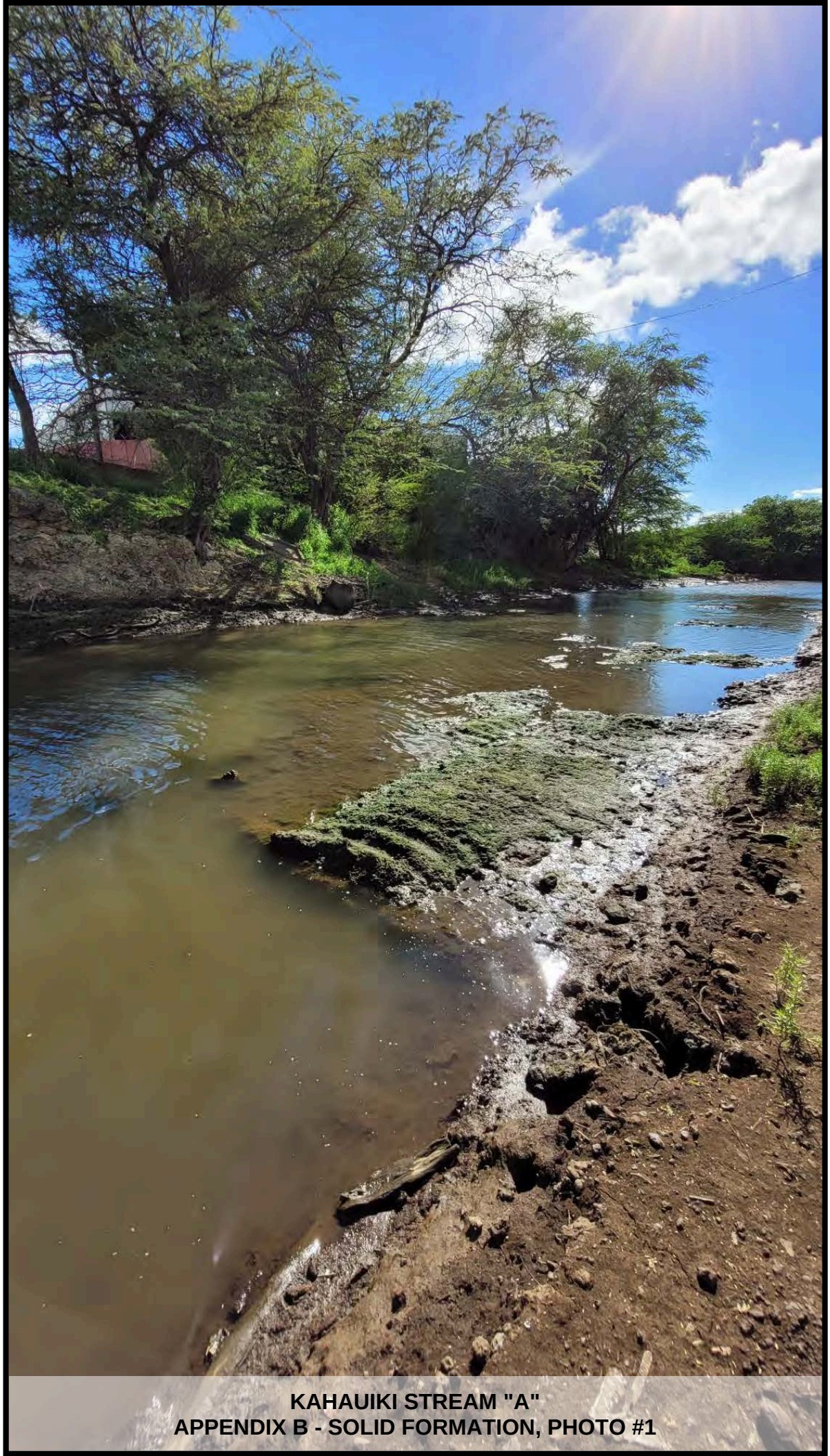
Attachment G: State Department of Health, Clean Water Branch Section 401

DESIGN COMPLETE

APPENDIX E

PHOTOGRAPHS OF SOLID FORMATION

Attachment G: State Department of Health, Clean Water Branch Section 401

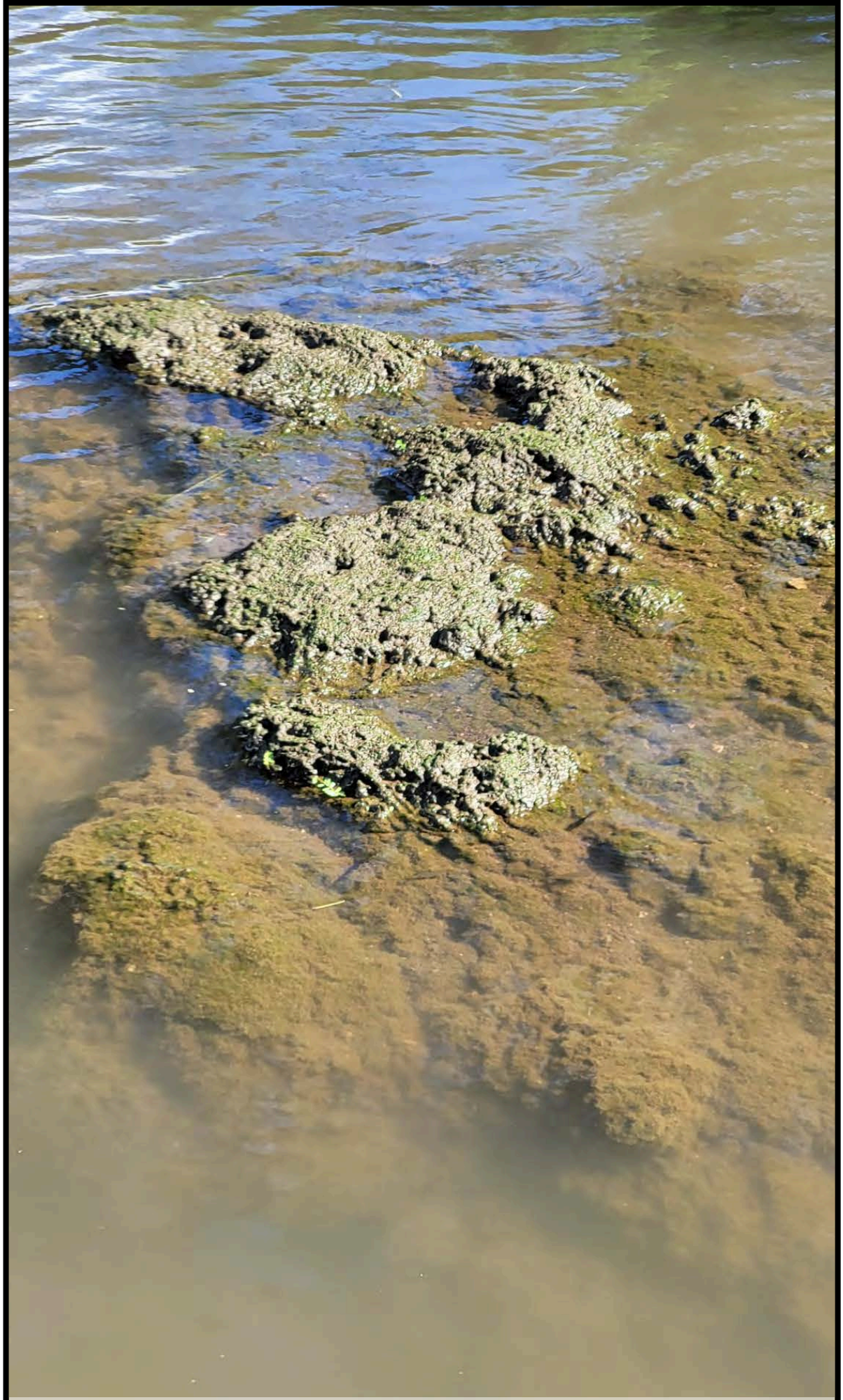


KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #1

Attachment G: State Department of Health, Clean Water Branch Section 401

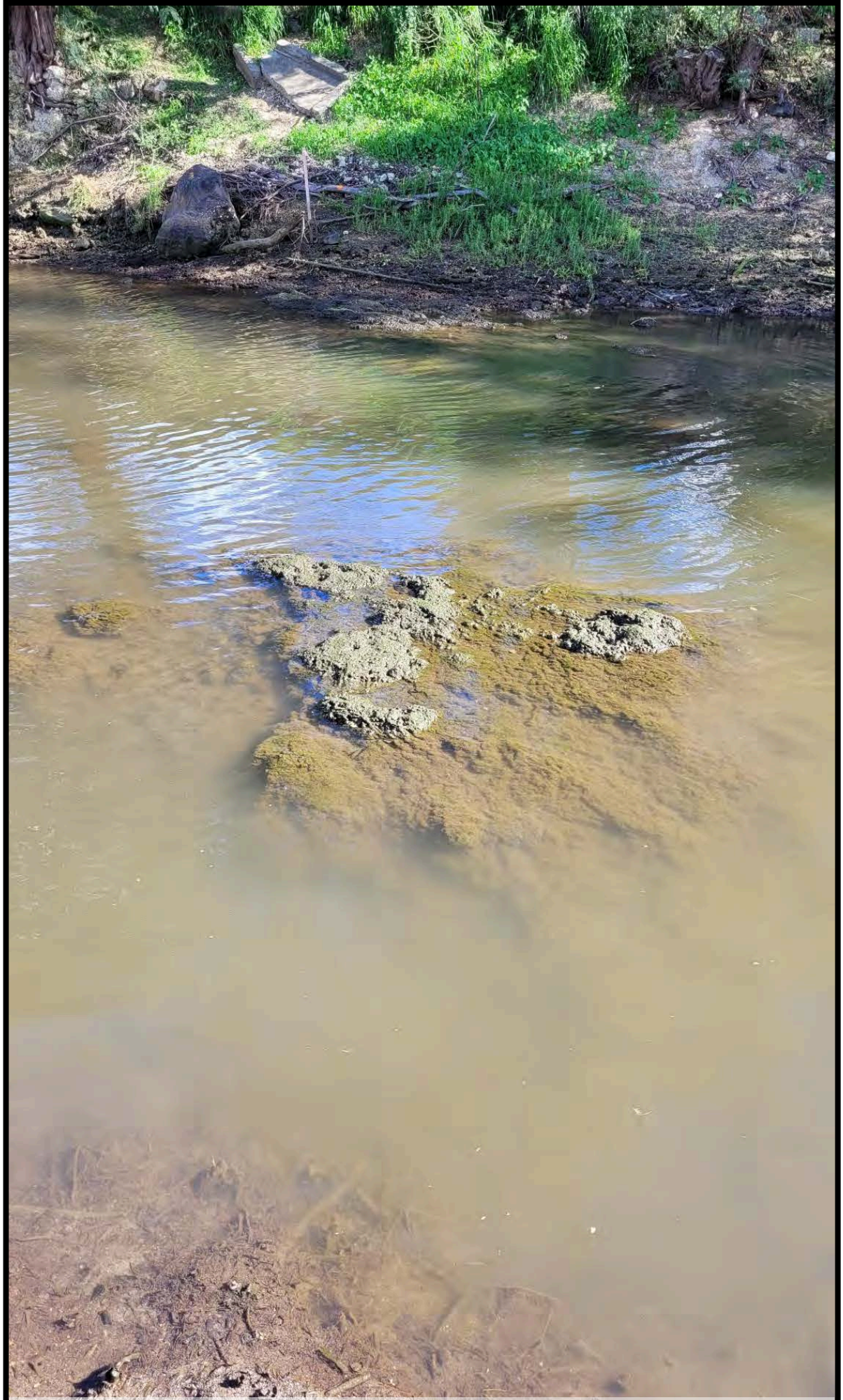
KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #2

Attachment G: State Department of Health, Clean Water Branch Section 401



KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #3

Attachment G: State Department of Health, Clean Water Branch Section 401



KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #4

Attachment G: State Department of Health, Clean Water Branch Section 401

KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #5

Attachment G: State Department of Health, Clean Water Branch Section 401

KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #6

Attachment G: State Department of Health, Clean Water Branch Section 401

KAHAUIKI STREAM "A"
APPENDIX B - SOLID FORMATION, PHOTO #7

Attachment G: State Department of Health, Clean Water Branch Section 401

APPENDIX F

LOCATION OF CONCRETE DRAINAGE PIPES

Attachment G: State Department of Health, Clean Water Branch Section 401

LEGEND:

DREDGE AREA / LIMIT

PROJECT LIMIT

SANITARY SEWER NOTES:

1. THE CONTRACTOR SHALL MAINTAIN A MINIMUM CLEARANCE OF 5' FROM THE CENTER OF ANY EXISTING SEWERLINE.
2. BEGINNING FROM THE MINIMUM 5' CLEARANCE, THE CONTRACTOR SHALL TAPER THE EXCAVATION OUTWARDS, AWAY FROM THE SEWER LINE, SO THAT THE SEWER LINE WILL REMAIN SUPPORTED AND STRUCTURALLY SOUND.
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5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY DPW SPILL LINE OF ALL SPILLS (INCLUDING WASTEWATER). DURING BUSINESS HOURS: 656-1111, AFTER HOURS (IOC) 656-3272.
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NOTES:

1. HORIZONTAL COORDINATES AND AZIMUTHS ARE REFERENCED TO HAWAII STATE PLANE, ZONE 3, NAD 83 (PA11), EPOCH 2010 U.S. SURVEY FEET. AZIMUTHS ARE MEASURED CLOCKWISE FROM TRUE SOUTH.
2. ELEVATIONS ARE REFERENCED TO SHAFT BOLT, A 3/4 INCH BRASS PIN (PUBLISHED THROUGH NATIONAL GEODETIC SURVEY), ELEVATION=46.50 FEET, MEAN SEA LEVEL, 1983-2001 TIDAL EPOCH, U.S. SURVEY FEET.
3. FIELD SURVEY WORK HAS BEEN CONDUCTED BY SAM O. HIROTA, INC. ON NOVEMBER 15, 2018 - JANUARY 2, 2019.
4. BATHYMETRY SPOT ELEVATIONS WERE SURVEYED BY USING A FIBERGLASS ATOMIC ROD (BOTTOM OF ROD BEING APPROXIMATELY 2 INCHES IN DIAMETER). THE ATOMIC ROD WAS USED TO LOCATE THE EXISTING GROUND AND SILT IN CERTAIN AREAS. IN THE FIELD, SILT IS DEFINED AS A SOFT UNDERWATER MUD THAT WAS EASILY PENETRATED BY ATOMIC ROD TO LOCATE THE EXISTING GROUND.
5. SEWER LINES AT KAHAUIKI A STA 15+49, STA 15+65 AND KAHAUIKI B STA 1+50 ARE NOT TO BE REMOVED OR DISTURBED. CONTRACTOR IS RESPONSIBLE FOR DREDGING AROUND UTILITIES SUCH THAT FUNCTION OF SEWER LINES ARE NOT DISTURBED OR IMPACTED. ANY DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE GOVERNMENT.
6. UTILITY LINES BETWEEN UTILITY POLES PRESENT HAZARD AT ABOUT 15-20 FEET ABOVE GROUND.
7. NO DREDGING AT THE FUNSTON LOOP BRIDGE, AS INDICATED IN STA 18+60. BOTTOM DEPTHS SHOULD TRANSITION FROM NATURAL GROUND DEPTH AT THE BRIDGE TO THE DREDGE CUT INDICATED AT STA 18+50 AND 18+00.
8. NO DREDGING AT STA 3+50 ON ALIGNMENT B, AS INDICATED IN THE CROSS SECTION. DREDGING SHOULD TRANSITION FROM NATURAL GROUND SURFACE AT STA 3+50 TO THE DREDGE CUT INDICATED AT STA 3+00.
9. TREES OUTSIDE OFTHE DREDGE LIMITS ARE NOT TO BE TRIMMED, CUT DOWN OR REMOVED.
10. MAINTAIN A 3 FOOT MINIMUM SETBACK DISTANCE FROM EXISTING STRUCTURES.

KS-2
(1/2" REBAR WITH CAP)
63,046.67 N
1,677,855.07 E
ELEV=14.42 FT

POE KAHAUIKI A
N 167877.18
E 62914.36

KS-3
(1/2" REBAR WITH CAP)
62,881.28 N
1,677,792.09 E
ELEV=8.66 FT

APROXIMATE LOCATION
OF LARGE TREE STUMP
(REMOVE AS NEEDED)

APPROXIMATE LOCATION
OF ACTIVE SEWER LINE
DO NOT DISRUPT

NO DREDGING
IN THIS AREA

Location of culvert (two 36-inch diameter pipes)

PROTECT
ROAD
GUARD RAIL
TO REMAIN

PROTECT
18" RCP
INV=1.14
TO REMAIN

36" RCP
INV=-4.32
TO REMAIN

PROTECT
8" PVC PIPE
INV=1.75
TO REMAIN

CHAIN LINK
FENCE
TO REMAIN

PROTECT
8" PVC PIPE
INV=1.75
TO REMAIN

36" RCP
INV=-4.59
TO REMAIN

36" RCP
INV=-4.23
TO REMAIN

36" RCP
INV=-4.09
TO REMAIN

PROTECT
24" RCP
INV=0.16
TO REMAIN

PROTECT
CONCRETE
HEADWALL
TO REMAIN

PROTECT
18" RCP
INV-1.32
TO REMAIN

HOLLOW TILE
WALL, TO REMAIN

KS-9
(3/4" PIPE WITH PLUG)
62,669.69 N
1,677,883.86 E
ELEV=5.13 FT

KS-10
(1/2" PIPE WITH PLUG)
62,534.82 N
1,678,105.39 E
ELEV=4.56 FT

POE KAHAUIKI B
N 62612.71
E 1678042.30

POB KAHAUIKI B
N 62764.27
E 1677733.90

KAHAUIKI A 18+60
KAHAUIKI A 18+50
KAHAUIKI A 18+00
KAHAUIKI A 17+50
KAHAUIKI A 17+00
KAHAUIKI A 16+50
KAHAUIKI A 16+00
KAHAUIKI B 0+50
KAHAUIKI B 1+00
KAHAUIKI B 1+50
KAHAUIKI B 2+00
KAHAUIKI B 2+50
KAHAUIKI B 3+00
KAHAUIKI B 3+50

MATCHLINE: C-106
C-105

SITE PLAN KAHAUIKI A STA 16+00- STA 18+60 AND KAHAUIKI B (TRIBUTARY) STA 0+00 - STA 3+50

SCALE: 1" = 20'

KEY PLAN
NTS

0 20' 40'
SCALE: 1"=20'

Attachment G: State Department of Health, Clean Water Branch Section 401

DESIGN COMPLETE

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: TS
DRAWN BY: CP
CHECKED BY: LM
SUBMITTED BY:
SIZE: 34X22
FILE NUMBER

ISSUE DATE: 26 JUNE 2020
SOLICITATION NO.:
CONTRACT NO.:
RTA SUBMITTAL

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
HONOLULU, HAWAII

CIVIL WORKS TECHNICAL BRANCH

FY21 KAHAUIKI STREAM MAINTENANCE DREDGING
FORT SHAFTER FLATS, ISLAND OF OAHU

SITE PLAN KAHAUIKI A STA 16+00 - STA 18+60
& KAHAUIKI B (TRIBUTARY)STA 0+00 - STA 3+50

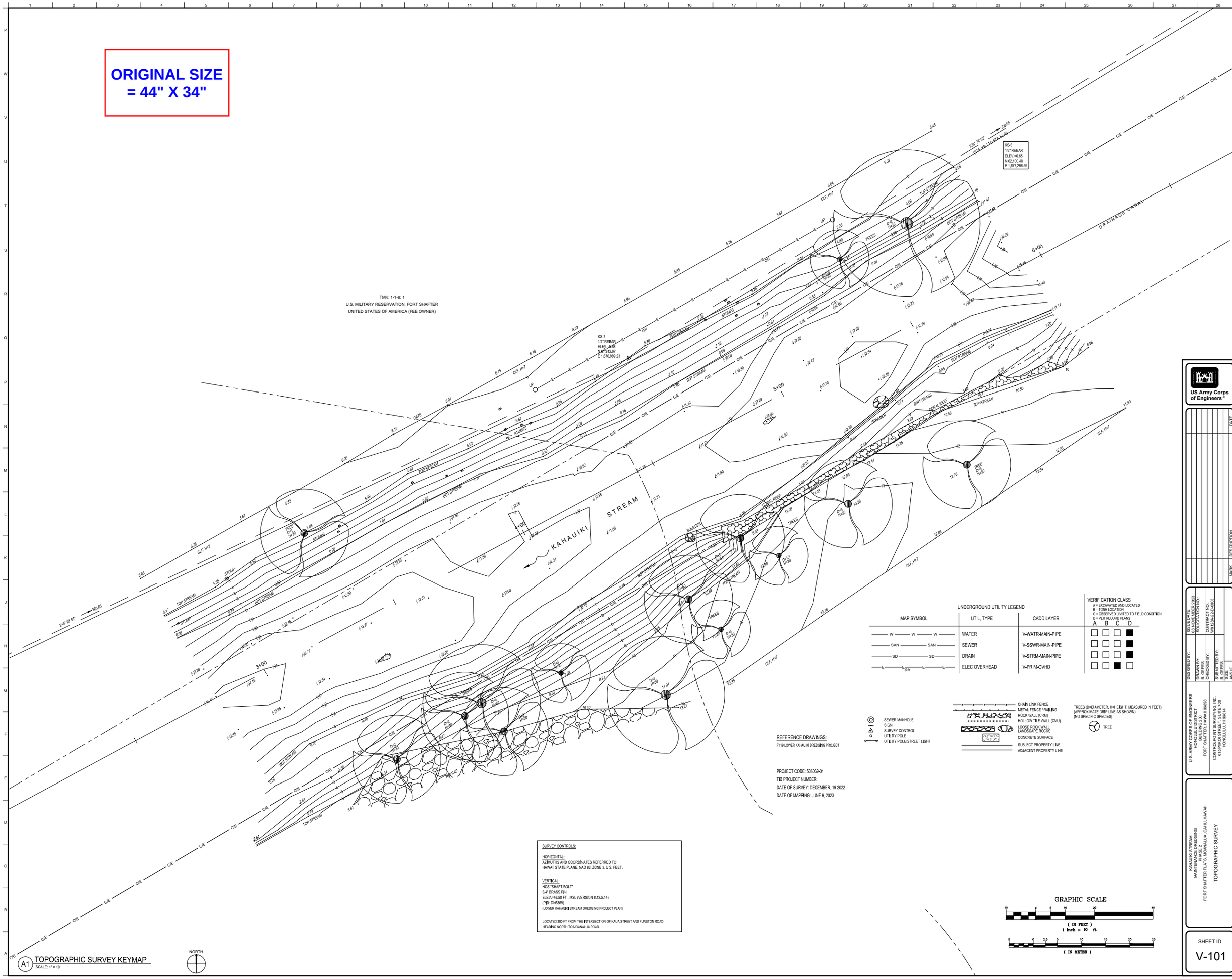
SHEET ID
C-106

APPENDIX G

TOPOGRAPHIC SURVEY
MAY 2023, r. NOVEMBER 2023

Attachment G: State Department of Health, Clean Water Branch Section 401

ORIGINAL SIZE = 44" X 34"



SURVEY CONTROLS:

HORIZONTAL:
AZIMUTHS AND COORDINATES REFERRED TO HAWAII STATE PLANE, NAD 83, ZONE 3, U.S. FEET.

VERTICAL:
NGS "SHAFT BOLT"
3/4" BRASS PIN
ELEV.=46.50 FT., MSL (VERSION 8,12,5,14)
(PID: DN8368)
(LOWER KAHAUIKI STREAM DREDGING PROJECT PLAN)

LOCATED 300 FT FROM THE INTERSECTION OF KAUA STREET AND FUNSTON ROAD HEADING NORTH TO MOANALUA ROAD.

UNDERGROUND UTILITY LEGEND

MAP SYMBOL	UTIL. TYPE	CADD LAYER
W W W	WATER	V-WATR-MAIN-PIPE
SAN SAN	SEWER	V-SSWR-MAIN-PIPE
SD SD	DRAIN	V-STRM-MAIN-PIPE
E E E E	ELEC OVERHEAD	V-PRIM-OVHD

VERIFICATION CLASS
A = EXCAVATED AND LOCATED
B = TONE LOCATION
C = OBSERVED LIMITED TO FIELD CONDITION
D = PER RECORD PLANS

A	B	C	D
☐	☐	☐	■
☐	☐	☐	■
☐	☐	☐	■
☐	☐	■	☐

SEWER MANHOLE
SIGN
SURVEY CONTROL
UTILITY POLE
UTILITY POLE/STREET LIGHT

CHAIN LINK FENCE
METAL FENCE / RAILING
ROCK WALL (CRM)
HOLLOW TILE WALL (CMU)
LOOSE ROCK WALL
LANDSCAPE ROCKS
CONCRETE SURFACE
SUBJECT PROPERTY LINE
ADJACENT PROPERTY LINE

TREES (D=DIAMETER, H=HEIGHT, MEASURED IN FEET)
(APPROXIMATE DRIP LINE AS SHOWN)
(NO SPECIFIC SPECIES)
TREE

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.
(IN METER)

A1 TOPOGRAPHIC SURVEY KEYMAP
SCALE: 1" = 10'

NORTH

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

%PRODUCTION DATA 1%
%PRODUCTION DATA 4%
%PRODUCTION DATA 3%
%PRODUCTION DATA 2%

ISSUE DATE: NOVEMBER 2020
SOLICITATION NO.:
CONTRACT NO.
W912DA-22-D-0003

DESIGNED BY:
DRAWN BY: B. GEIPES
CHECKED BY:
SUBMITTED BY: B. GEIPES
SCALE: ANSI E

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
BUILDING 230
FORT SHAFTER, HAWAII 96858

CONTROL POINT SURVEYING, INC.
615 PIIKOI STREET, SUITE 702
HONOLULU, HI 96814

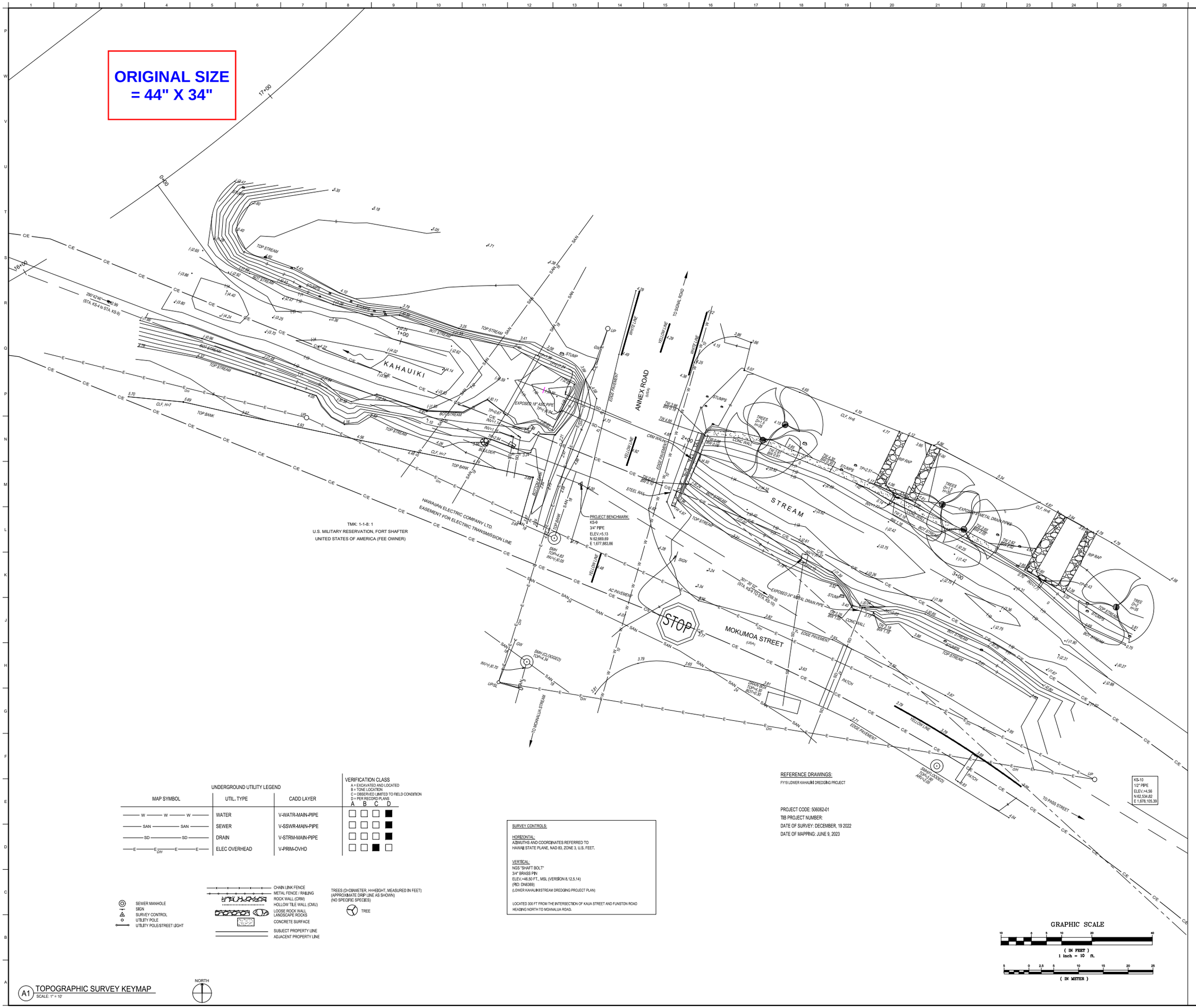
KAHAUIKI STREAM
MAINTENANCE DREDGING
PROJECT NO. 506062
FORT SHAFTER FLATS, MOANALUA, OAHU, HAWAII

TOPOGRAPHIC SURVEY

SHEET ID
V-101

Attachment G: State Department of Health, Clean Water Branch Section 401

ORIGINAL SIZE = 44" X 34"



UNDERGROUND UTILITY LEGEND

MAP SYMBOL	UTIL. TYPE	CADD LAYER	VERIFICATION CLASS A	B	C	D
W W W	WATER	V-WATR-MAIN-PIPE	☐	☐	☐	■
SAN SAN	SEWER	V-SSWR-MAIN-PIPE	☐	☐	☐	■
SD SD	DRAIN	V-STRM-MAIN-PIPE	☐	☐	☐	■
E E E E	ELEC OVERHEAD	V-PRIM-OVHD	☐	☐	■	☐

VERIFICATION CLASS
A = EXCAVATED AND LOCATED
B = TONE LOCATION
C = OBSERVED LIMITED TO FIELD CONDITION
D = PER RECORD PLANS

SEWER MANHOLE
SIGN
SURVEY CONTROL
UTILITY POLE
UTILITY POLE/STREET LIGHT

CHAIN LINK FENCE
METAL FENCE / RAILING
ROCK WALL (CRM)
HOLLOW TILE WALL (CMU)
LOOSE ROCK WALL
LANDSCAPE ROCKS
CONCRETE SURFACE
SUBJECT PROPERTY LINE
ADJACENT PROPERTY LINE

TREES (D=DIAMETER, HH=HEIGHT, MEASURED IN FEET)
(APPROXIMATE DRIP LINE AS SHOWN)
(NO SPECIFIC SPECIES)
TREE

SURVEY CONTROLS:

HORIZONTAL:
AZIMUTHS AND COORDINATES REFERRED TO HAWAII STATE PLANE, NAD 83, ZONE 3, U.S. FEET.

VERTICAL:
NGS "SHAFT BOLT"
3/4" BRASS PIN
ELEV.=46.50 FT., MSL (VERSION 8.12.5.14)
(PID: DN6369)
(LOWER KAHAUIKI STREAM DREDGING PROJECT PLAN)

LOCATED 300 FT FROM THE INTERSECTION OF KAUA STREET AND FUNSTON ROAD HEADING NORTH TO MOANALUA ROAD.

REFERENCE DRAWINGS:
FY19 LOWER KAHAUIKI DREDGING PROJECT

PROJECT CODE: 506062-01
TIB PROJECT NUMBER:
DATE OF SURVEY: DECEMBER, 19 2022
DATE OF MAPPING: JUNE 9, 2023

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.
(IN METER)

A1 TOPOGRAPHIC SURVEY KEYMAP
SCALE: 1" = 10'

NORTH

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: (SEPTEMBER 2023)
SOLICITATION NO.
CONTRACT NO.
W912PA-22-D-0003

DESIGNED BY:
DRAWN BY: B. CEPES
CHECKED BY:
SUBMITTED BY: B. CEPES
R. ANSLIE

U.S. ARMY CORPS OF ENGINEERS
HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858

CONTROL POINT SURVEYING, INC.
677 IHOLO STREET, SUITE 200
HONOLULU, HI 96814

KAHAUIKI STREAM
MAINTENANCE DREDGING
PROJECT
FORT SHAFTER FLATS, MOANALUA, OAHU, HAWAII

TOPOGRAPHIC SURVEY

SHEET ID
V-102

%PRODUCTION DATA 1%
%PRODUCTION DATA 4%
%PRODUCTION DATA 3%
%PRODUCTION DATA 2%

Attachment G: State Department of Health, Clean Water Branch Section 401

APPENDIX H

GEOTECHNICAL INVESTIGATION REPORT
DECEMBER 2023

Attachment G: State Department of Health, Clean Water Branch Section 401

GEOTECHNICAL ENGINEERING EXPLORATION

KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2
FORT SHAFTER FLATS
HONOLULU, OAHU, HAWAII

DECEMBER 13, 2023

Prepared for:
OKAHARA AND ASSOCIATES, INC.

PROJECT NO. 082922-00

Kokua Geotech LLC
Soil and Foundation Engineering

Attachment G: State Department of Health, Clean Water Branch Section 401

December 13, 2023
Project No. 082922-00

Okahara and Associates, Inc.
201 Merchant Street, Suite 1650
Honolulu, HI 96813

Attention: Mr. Irvin Higashi

Subject: **Geotechnical Engineering Exploration**
Kahauiki Stream Maintenance Dredging, Phase 2
Fort Shafter Flats
Honolulu, Oahu, Hawaii

Dear **Mr. Higashi**:

We are pleased to submit this report entitled "Geotechnical Engineering Exploration, Kahauiki Stream Maintenance Dredging, Phase 2, Fort Shafter Flats, Honolulu, Oahu, Hawaii" prepared for the design of the project.

The purpose of our field exploration and this report was to observe and evaluate the general subsurface conditions at accessible locations at the project site to formulate geotechnical recommendations to assist in the design of the project. Our work was performed in general accordance with the scope of services outlined in our revised fee proposal dated September 1, 2022.

Our findings and recommendations are summarized as follows:

1. Our in-water borings along Kahauiki Stream A (Boring Nos. 1 through 4) generally encountered the mudline at depths ranging from about 1.5 to 3.5 feet below the water surface. Coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel were encountered at the mudline at Boring Nos. 1 and 2 and extended down to depths of about 7 feet and the maximum depth explored in Boring No. 1 of about 14.5 feet below the water surface (or about 4.6 and 13 feet below the mudline level, respectively).

   Alluvial soils generally consisting of medium dense clayey sand and soft to stiff silty/sandy clay were encountered at the mudline along Kahauiki Stream A in Boring Nos. 3 and 4 and below the coralline detritus materials encountered in Boring No. 2 and extended down to the maximum depth explored in these borings of about 10 feet below the water surface (or 7.6 feet below the mudline level).

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2. Our land boring near Kahauki Stream B (Boring No. 5) generally encountered surface fill materials overlying coralline detritus materials and alluvial soils extending down to the maximum depth explored of about 21.5 feet below the existing ground surface. The surface fill materials were encountered to a depth of about 4.5 feet below the existing ground surface and generally consisted of dense to very dense silty sand with some gravel.

   Coralline detritus materials generally consisting of very loose to very dense silty sand and gravel were encountered underlying the surface fill materials in Boring No. 5 near Kahauiki Stream B and extended down to a depth of about 18 feet below the existing ground surface. Alluvial soils generally consisting of soft to medium stiff silty clay were encountered underlying the coralline detritus materials and extended down to the maximum depth explored of about 21.5 feet below the existing ground surface.

3. We encountered groundwater in the boring near Kahauiki Stream B (Boring No. 5) at a depth of about 5 feet below the existing ground surface at the time of our field exploration. Considering the proximity of the project site to Kahauiki Stream and the Pacific Ocean, groundwater levels are anticipated to vary in response to the water level in the stream and tidal fluctuation. In addition, groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

4. At the time of our field exploration, coralline materials were observed to be exposed along portions of the southern stream bank as well as along portions of the stream bed of Kahauiki Stream A during lower tide levels. The exposed coralline materials observed along portions of the southern stream bank generally consisted of moderately cemented silty coralline sand and gravel (coralline detritus) with some areas of coral reef formation.

5. Coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel were encountered at the mudline within two of our borings along Kahauiki Stream A (Boring Nos. 1 and 2) and extended down to depths of about 7 feet and the maximum depth explored in Boring No. 1 of about 14.5 feet below the water surface (or about 4.6 and 13 feet below the mudline level, respectively).

6. Based on our field exploration, excavations along the Kahauiki Stream A stream bed will likely encounter coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel and alluvial soils generally consisting of medium dense clayey sand and soft to stiff silty/sandy clay. In addition, hard coral formation and boulders may be encountered in the stream bed excavations.

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It is anticipated that most of the material may be excavated with normal heavy excavation equipment. However, excavations encountering boulders and hard coral formation may require the use of hoerams. It should be noted that coral formations typically contain localized hard and crystallized zones. Therefore, we anticipate that some difficult excavation conditions may arise in localized areas during construction when the coral formation is encountered.

7. Based on the information provided, we anticipate excavation depths on the order of about 7 to 8 feet will be required for installation of the new replacement drain lines near Kahauiki Stream B. We envision soft and/or loose soils may be encountered at or near the pipe invert elevations. Therefore, we recommend providing a subgrade stabilization layer consisting of 18 inches of No. 2 Rock (ASTM C 33, No. 4 gradation) or No. 3 Fine gravel (ASTM C33, No. 67 gradation) wrapped in a non-woven filter fabric (Mirafi 180N or equivalent) below the bedding layer for uniform support, if soft and/or loose soils are encountered.

8. The construction plans and specifications for the project should be forwarded to us for review to determine whether the recommendations contained in this report are adequately reflected in those documents. If this review is not made, Kokua Geotech LLC cannot assume responsibility for misinterpretation of our recommendations.

9. Kokua Geotech LLC should also be retained to monitor site grading, drain line installation operations, and other aspects of earthwork construction to determine whether the recommendations of this report are followed. The recommendations presented herein are contingent upon such observations. If the actual exposed subsurface soil conditions encountered during construction differ from those assumed or considered in this report, Kokua Geotech LLC should be contacted to review and/or revise the geotechnical recommendations presented herein.

Detailed discussion of our findings and geotechnical engineering recommendations are contained in the body of this report. We appreciate the opportunity to be of service for this project. Should you have any questions concerning this report, please contact our office.

Very truly yours,

Kokua Geotech LLC

Xiaobin (Tim) Lin, P.E.
President

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GEOTECHNICAL ENGINEERING EXPLORATION
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2
FORT SHAFTER FLATS
HONOLULU, OAHU, HAWAII

SECTION 1.0 INTRODUCTION

We have performed a geotechnical engineering exploration for the *Kahauiki Stream Maintenance Dredging, Phase 2* project in Honolulu on the Island of Oahu, Hawaii. The location of the project and general vicinity are shown on the Project Location Map, Plate 1.

The purpose of our exploration was to observe and evaluate the general subsurface conditions at accessible locations at the project site to formulate geotechnical recommendations to assist in the design of the project. This report summarizes the findings and presents our geotechnical recommendations resulting from our site reconnaissance, field exploration, laboratory testing, and engineering analyses for the project. The findings and recommendations presented herein are subject to the limitations noted at the end of this report.

1.1 PROJECT CONSIDERATIONS

The project generally involves the dredging and clearing of the remaining section of Kahauiki Stream A from Station 1+50 to 5+00 and unblock or potentially repair/replace two 36-inch diameter existing concrete drainage pipes located near Kahauiki Stream B at Station 2+00 at Fort Shafter Flats in Honolulu on the Island of Oahu, Hawaii. We understand dredging efforts were initiated in 2020 to mitigate flooding of the stream but were not completed due to numerous differing site conditions, including solid rock formation, and permitting complications.

Based on the information provided, the work for this project will be split into two phases, an Investigation Phase and a Design Phase (will be awarded at a later date). The purpose of the investigation phase along Kahauiki Stream A is to determine the approximate limits and thickness of the solid formation, identify its material composition, and to provide recommendations for removal down to Elevation -5.5 feet Mean Sea Level (MSL). Based on the information provided, we understand the approximate limits of the solid formation previously encountered along

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Kahauiki Stream A was generally from Station 3+60 to 5+30 and was estimated to be roughly 7,500 square feet.

We understand an assessment of the blockage and condition of the existing 36-inch diameter concrete drainage pipes along Kahauiki Stream B is to be performed by others along with recommendations to unblock the pipes. It is our understanding that replacing the concrete drainage pipes in this area is also being considered as an option for the project. A layout of the project site is shown on the Site Plans, Plates 2.1 and 2.2.

1.2 PURPOSE AND SCOPE OF WORK

The purpose of our services was to generally explore and evaluate the subsurface soil conditions at accessible locations at the project site to provide geotechnical recommendations to assist in the design of the project. The work was performed in general accordance with our revised fee proposal dated September 1, 2022. The scope of work for this exploration included the following items:

1. Research and review of available in-house soils boring data and other information for the project.

2. Coordination of boring stake-out and utility clearances at the proposed boring locations by our field engineer.

3. Mobilization of support equipment (crane, floating raft, etc.) to the project site and back.

4. Mobilization and demobilization of truck and track-mounted drilling equipment and two operators to the project site and back.

5. Drilling and sampling of four stream borings along Kahauiki Stream A extending to depths ranging from about 6.9 to 13 feet below the stream mudline. In addition, drilling and sampling of one land boring near Kahauiki Stream B extending to a depth of about 21.5 feet below the existing ground surface.

6. Coordination of the field exploration and logging of the borings by our field engineer.

7. Laboratory testing of selected soil samples obtained during the field exploration as an aid in classifying the materials and evaluating their engineering properties.

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8. Analyses of the field and laboratory data to formulate geotechnical recommendations to assist in the design of the project.

9. Preparation of this report summarizing our work on the project and presenting our findings and recommendations.

10. Coordination of our overall work on the project by our senior engineer.

11. Quality assurance and client/design team consultation by our principal engineer.

12. Miscellaneous work efforts such as drafting, word processing, and clerical support.

Detailed descriptions of our field exploration methodology are presented in the following section and the Logs of Borings are presented in Appendix A. Results of the laboratory tests performed are presented in Appendix B. Photographs of the rock core samples are presented in Appendix C.

END OF INTRODUCTION

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SECTION 2.0 SITE CHARACTERIZATION AND FINDINGS

2.1 GENERAL SITE GEOLOGY

The project site is generally located on the southeastern flank of the Koolau Volcano on the Island of Oahu. Based on the geologic maps of the Island of Oahu (Stearns, 1939 and Sherrod and others, 2007), the general area of the project site is underlain by Lagoon and Reef Deposits (Qcrs), Alluvium (Qa), Older Alluvium (QTao), and Manmade Fill (Qf).

During the Pleistocene Epoch, a time period that began about 2.6 million years ago and lasted until about 11,700 years ago, sea levels fluctuated in response to the cycles of continental glaciation. As the glaciers grew and advanced, less water was available to fill the oceanic basins such that sea levels fell below the present stands of the sea. When the glaciers melted and receded, an excess of water became available such that the sea levels rose to above the present sea level.

The higher sea level stands caused the formation of deltas and fans of accumulated terrigenous sediments in the heads of old bays, accumulated reef deposits at correspondingly higher elevations, and deposited lagoonal/marine sediments in the quiet waters protected by fringing reefs. The processes of landform erosion, sediment deposition, and reef development were affected by these glacio-eustatic sea level fluctuations.

When the sea level was relatively lower, the erosional base level was correspondingly lower and stream valleys were carved deeper into the Island's basaltic rock, the fringing coastal sediments, and the offshore reef deposits. Also, during periods of relatively lower sea level, the sub-aerial exposure of calcareous marine sediments caused consolidation and cementation of the deposits to form hardened calcareous deposits.

Erosional processes in the mountainous regions of Hawaii are dominated by the detachment of soil and rock masses from the valley walls which are transported downslope toward the axis of the valley primarily by gravity as colluvium. Colluvial accumulations often consist of material that is generally deposited by gravity fall, rain wash and mudflow. Once these

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materials reach the stream in the central portion of the valley, alluvial processes become dominant, and the sediments are transported and deposited as alluvium. The project site is located along Kahauiki Stream where the subsurface conditions are dominated by alluvial soil deposits.

Placement of near-surface man-made fills associated with the development of urban areas within the last 80 years has brought the Honolulu Coastal Plain to its present form. In the early part of this century, much of the area consisted of low elevation marsh wetlands. As the City of Honolulu grew and lands were urbanized, man-made fills were placed to reclaim the marshy areas and lagoons for development. It should be noted that much of the resulting fill materials placed are of poor quality in terms of supporting heavy structural loads.

The surface soils underlying the project sites are classified as Honouliuli Clay (HxA) and Fill Land (FL) by the U.S. Soil Conservation Service in their publication "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii" (1972). The Honouliuli Clay (HxA) soil type is described as dark reddish brown, very sticky and plastic clay that developed in alluvium derived from basic igneous rock. This soil type is also described as having a high shrink-swell potential, low shear strength, and poor workability.

Conversely, Fill Land (FL) is described as occurring mostly near Pearl Harbor and in Honolulu, adjacent to the ocean. It is described as areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. Mass grading work and development of Fort Shafter Flats have brought the project site to its present form.

2.2 SITE DESCRIPTION

The project site is generally located along Kahauiki Stream at the southwestern portion of Fort Shafter Flats in Honolulu on the Island of Oahu, Hawaii. In general, the section of Kahauiki Stream A included in this study was observed to be in a northeast to southwest orientation and is located near the stream's intersection with Moanalua Stream to the west. Conversely, the section

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of Kahauiki Stream B included in this study was observed to be in an east to west orientation and is located near the stream's intersection with Kahauiki Stream A to the west

Based on a topographic survey plan provided, the northern stream bank along the study area of Kahauiki Stream A ranges from roughly 4.5 to 6 feet high with existing ground surface elevations along the top of bank ranging from about +5.9 to +4.7 feet MSL. Conversely, the southern stream bank along the study area of Kahauiki Stream A ranges from roughly 6 to 13 feet high with existing ground surface elevations along the top of bank ranging from about +12.8 to +5.8 feet MSL. In addition, we anticipate elevations along the stream bed of the study area of Kahauiki Stream A to range from about -0.3 to -6.3 feet MSL.

At the time of our field exploration, coralline materials were observed to be exposed along portions of the southern stream bank as well as along portions of the stream bed of Kahauiki Stream A during lower tide levels. The exposed coralline materials observed along portions of the southern stream bank generally consisted of moderately cemented silty coralline sand and gravel (coralline detritus) with some areas of coral reef formation. Photographs of the coralline materials observed to be exposed along portions of the southern stream bank and along portions of the stream bed during lower tide levels are presented on Plates 3.1 through 3.3.

In general, the northern stream bank along the study area of Kahauiki Stream B ranges from roughly 3 to 6 feet high with existing ground surface elevations along the top of bank ranging from about +5.6 to +2.9 feet MSL. Conversely, the southern stream bank along the study area of Kahauiki Stream B ranges from roughly 3 to 5 feet high with existing ground surface elevations along the top of bank ranging from about +4.8 to +3.3 feet MSL. In addition, we anticipate elevations along the stream bed of the study area of Kahauiki Stream B to range from about -0.2 to -4.4 feet MSL.

2.3 FIELD EXPLORATION

We explored the subsurface conditions along Kahauiki Stream A by drilling and sampling four stream borings, designated as Boring Nos. 1 through 4, extending to depths ranging from about 6.9 to 13 feet below the stream mudline. In addition, we explored the subsurface conditions

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along Kahauiki Stream B by drilling and sampling one land boring, designated as Boring No. 5, extending to a depth of about 21.5 feet below the existing ground surface.

The stream borings were drilled utilizing a track-mounted drill rig equipped with coring tools and mounted to a floating platform, while the land borings was drilled utilizing a trailer-mounted drill rig equipped with continuous, hollow stem flight augers. In addition, a bulk sample of the near-surface soils was also obtained to evaluate the pavement characteristics of the near-surface soils. The approximate boring locations are shown on the Site Plans, Plates 2.1 and 2.2.

Our engineer monitored the drilling operations on a near continuous (full-time) basis and classified the materials encountered in the borings by visual and textural examination in the field in general accordance with ASTM D2488. These classifications were further reviewed visually and by testing in the laboratory. Soils were classified in general accordance with ASTM D2487 and the Unified Soil Classification System.

Soil samples were obtained in general accordance with ASTM D1586 by driving a 2-inch OD standard penetration sampler with a 140-pound hammer falling 30 inches. In addition, relatively undisturbed soil samples were obtained in general accordance with ASTM D3550 by driving a 3-inch OD Modified California sampler using the same hammer and drop. The blow counts needed to drive the sampler the second and third 6 inches of an 18-inch drive are shown as the “Sampling Resistance” on the Logs of Borings at the appropriate sample depths. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.

Pocket penetrometer tests were performed on selected cohesive soil samples retrieved in the field. The pocket penetrometer test provides an indication of the unconfined compressive strength of the sample. Pocket penetrometer test results are summarized on the Logs of Borings at the appropriate sample depths.

Core samples of the rock materials encountered in the borings were obtained by using diamond core drilling techniques in general accordance with ASTM D2113. Core drilling is a rotary

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drilling method that uses a hollow bit to cut into the rock formation. The rock material left in the hollow core of the bit is mechanically recovered for examination and description. Rock cores were described in general accordance with the Rock Description System in the publication "Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses" by the International Society for Rock Mechanics (March 1977).

Core recovery is defined as the ratio of the cumulative length of the core fragments recovered versus the total length of the core run, expressed as a percentage. Rock Quality Designation (RQD) is defined as the percentage of the core run in rock that is sound material in excess of 4 inches in length without discontinuities, discounting drilling induced fractures or breaks. Generally, the following is used to describe the relative quality of the rock, based on the "Practical Handbook of Physical Properties of Rocks and Minerals (1988)." Photographs of the core samples recovered from the borehole is presented in Appendix C.

SUMMARY OF RELATIVE QUALITY OF ROCK	
Rock Quality	**RQD** (%)
Very Poor	0 – 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 – 100

2.4 SUBSURFACE CONDITIONS

Our in-water borings along Kahauiki Stream A (Boring Nos. 1 through 4) generally encountered the mudline at depths ranging from about 1.5 to 3.5 feet below the water surface. Coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel were encountered at the mudline in Boring Nos. 1 and 2 and extended down to depths of about 7 feet and the maximum depth explored in Boring No. 1 of about 14.5 feet below the water surface (or about 4.6 and 13 feet below the mudline level, respectively).

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Alluvial soils generally consisting of medium dense clayey sand and soft to stiff silty/sandy clay were encountered at the mudline along Kahauiki Stream A in Boring Nos. 3 and 4 and below the coralline detritus materials encountered in Boring No. 2 and extended down to the maximum depth explored in these borings of about 10 feet below the water surface (or 7.6 feet below the mudline level).

Our land boring near Kahauiki Stream B (Boring No. 5) generally encountered surface fill materials overlying coralline detritus materials and alluvial soils extending down to the maximum depth explored of about 21.5 feet below the existing ground surface. The surface fill materials were encountered to a depth of about 4.5 feet below the existing ground surface and generally consisted of dense to very dense silty sand with some gravel.

Coralline detritus materials generally consisting of very loose to very dense silty sand and gravel were encountered underlying the surface fill materials in Boring No. 5 near Kahauiki Stream B and extended down to a depth of about 18 feet below the existing ground surface. Alluvial soils generally consisting of soft to medium stiff silty clay were encountered underlying the coralline detritus materials and extended down to the maximum depth explored of about 21.5 feet below the existing ground surface.

We encountered groundwater in the boring near Kahauiki Stream B (Boring No. 5) at a depth of about 5 feet below the existing ground surface at the time of our field exploration. However, it should be noted that groundwater levels are subject to change due to rainfall, tidal fluctuation, time of year, seasonal precipitation, surface water runoff, and other factors. Graphic representations of the materials encountered are presented on the Logs of Borings, Appendix A.

2.5 LABORATORY TESTING

Moisture Content (ASTM D2216) and Unit Weight (ASTM D2937) determinations were performed on selected samples as an aid in the classification and evaluation of soil properties. The test results are presented on the Logs of Borings at the appropriate sample depths.

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Three Atterberg Limits tests (ASTM D4318) were performed on selected soil samples to evaluate the liquid and plastic limits. The samples tested generally had relatively high Plasticity Indexes (PIs) ranging from about 31 to 58 and plotted as high plasticity clay (CH) on a Standard Plasticity Chart. The test results are summarized on the Logs of Borings at the appropriate sample depths. Graphic presentations of the Atterberg Limits test results are provided on Plate B-1.

Five Sieve Analysis tests (ASTM C117 and C136) were performed on selected soil samples to evaluate the gradation characteristics of the soil and to aid in soil classification. Graphic presentations of the grain size distributions are provided on Plate B-2.

One laboratory California Bearing Ratio (CBR) test (ASTM D1883) was performed on a bulk sample of the near-surface soils to evaluate the pavement support characteristics of the on-site soils. Results of the laboratory CBR test indicates the sample of on-site soils tested had a CBR value of about 90.1 with a corresponding CBR swell value of essentially zero. The CBR test results are presented on Plate B-3.

END OF SITE CHARACTERIZATION AND FINDINGS

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SECTION 3.0 DISCUSSION AND RECOMMENDATIONS

Based on the results of our field exploration, the in-water borings along Kahauiki Stream A (Boring Nos. 1 through 4) generally encountered the mudline at depths ranging from about 1.5 to 3.5 feet below the water surface. Coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel were encountered at the mudline in Boring Nos. 1 and 2 and extended down to depths of about 7 feet and the maximum depth explored in Boring No. 1 of about 14.5 feet below the water surface (or about 4.6 and 13 feet below the mudline level, respectively).

Alluvial soils generally consisting of medium dense clayey sand and soft to stiff silty/sandy clay were encountered at the mudline along Kahauiki Stream A in Boring Nos. 3 and 4 and below the coralline detritus materials encountered in Boring No. 2 and extended down to the maximum depth explored in these borings of about 10 feet below the water surface (or 7.6 feet below the mudline level).

Our land boring near Kahauiki Stream B (Boring No. 5) generally encountered surface fill materials overlying coralline detritus materials and alluvial soils extending down to the maximum depth explored of about 21.5 feet below the existing ground surface. The surface fill materials were encountered to a depth of about 4.5 feet below the existing ground surface and generally consisted of dense to very dense silty sand with some gravel.

Coralline detritus materials generally consisting of very loose to very dense silty sand and gravel were encountered underlying the surface fill materials in Boring No. 5 near Kahauiki Stream B and extended down to a depth of about 18 feet below the existing ground surface. Alluvial soils generally consisting of soft to medium stiff silty clay were encountered underlying the coralline detritus materials and extended down to the maximum depth explored of about 21.5 feet below the existing ground surface.

We encountered groundwater in the boring near Kahauiki Stream B (Boring No. 5) at a depth of about 5 feet below the existing ground surface at the time of our field exploration.

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Considering the proximity of the project site to Kahauiki Stream and the Pacific Ocean, groundwater levels are anticipated to vary in response to the water level in the stream and tidal fluctuation. In addition, groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

Detailed discussion of these items and our geotechnical recommendations for coralline materials along Kahauiki Stream A, design of new drain lines, and other geotechnical aspects of the project are further discussed in the following sections.

3.1 CORALLINE MATERIALS ALONG KAHAUIKI STREAM A

As discussed above, we understand the purpose of the investigation phase along Kahauiki Stream A is to determine the approximate limits and thickness of the solid formation, identify its material composition, and to provide recommendations for removal down to Elevation -5.5 feet MSL.

At the time of our field exploration, coralline materials were observed to be exposed along portions of the southern stream bank as well as along portions of the stream bed of Kahauiki Stream A during lower tide levels. The exposed coralline materials observed along portions of the southern stream bank generally consisted of moderately cemented silty coralline sand and gravel (coralline detritus) with some areas of coral reef formation.

Coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel were encountered at the mudline within two of our borings along Kahauiki Stream A (Boring Nos. 1 and 2) and extended down to depths of about 7 feet and the maximum depth explored in Boring No. 1 of about 14.5 feet below the water surface (or about 4.6 and 13 feet below the mudline level, respectively). A summary of the coralline materials encountered in our borings along Kahauiki Stream A is presented in the table below:

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SUMMARY OF CORALLINE MATERIALS ENCOUNTERED IN BORINGS				
Boring No.	Depth to Mudline below Water Surface (feet)	Approximate Elevations of Coral Materials (feet MSL)	Approximate Thickness of Coral below Mudline (feet)	Material Composition
1	1.5	-1.5 to -14.5	>13	Very loose to medium dense SILTY SAND (SM) with a little gravel (coralline detritus)
2	2.4	-2.4 to -7.0	4.6	Loose to medium dense SILTY GRAVEL (GM) with some sand (coralline detritus)
3	3.5	N/A	N/A	No coralline materials encountered
4	3.1	N/A	N/A	No coralline materials encountered

The approximate lateral extent of the coralline materials exposed along the stream bed and encountered in our borings as well as the exposed coralline materials observed along the southern stream bank are presented on the Site Plan, Plate 2.1. Photographs of these observed coralline materials are presented on Plates 3.1 through 3.3.

In general, we anticipate elevations along the stream bed of the study area of Kahauiki Stream A to range from about -0.3 to -6.3 feet MSL, resulting in excavation depths on the order of about 0 to 5.2 feet below the mudline to achieve the target removal elevation of -5.5 feet MSL. Based on our field exploration, excavations along the stream bed will likely encounter coralline detritus materials generally consisting of very loose to medium dense silty sand and gravel and alluvial soils generally consisting of medium dense clayey sand and soft to stiff silty/sandy clay. In addition, hard coral formation and boulders may be encountered in the stream bed excavations.

It is anticipated that most of the material may be excavated with normal heavy excavation equipment. However, excavations encountering boulders and hard coral formation may require the use of hoerams. It should be noted that coral formations typically contain localized hard and

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crystallized zones. Therefore, we anticipate that some difficult excavation conditions may arise in localized areas during construction when the coral formation is encountered.

3.2 OPEN TRENCH (CUT-AND-COVER) METHOD FOR NEW DRAIN LINES

We envision the new replacement drain lines near Kahauiki Stream B would likely be installed using conventional open trench (cut-and-cover) methods. Based on the information provided, we anticipate excavation depths on the order of about 7 to 8 feet will be required for installation of the new piping.

3.2.1 EARTH PRESSURE LOADS ON PIPES

Loads on buried pipes are influenced by the width of the trench, the size of the pipes, the unit weight of backfill material, and the friction resistance between the backfill material and the trench walls. To calculate the vertical loads on the buried utility pipe, we recommend that an average unit weight of 110 pounds per cubic feet (pcf) for the backfill material and a coefficient of friction of 0.3 be used. Earth forces acting upon the pipe generally increase rapidly with the width of the trench. Therefore, the width of the trench should be kept to a minimum. Traffic loads on the buried pipes should also be considered for the portion of the pipes located in roadway areas.

3.2.2 TRENCH EXCAVATION

All excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. The contractor should determine the method and equipment to be used for the excavations, subject to practical limits and safety considerations. In addition, the excavations should comply with the applicable federal, state, and local safety requirements. The contractor should be responsible for trench shoring design and installation.

As mentioned above, we anticipate excavation depths on the order of about 7 to 8 feet may be required for installation of the new drain lines. Based on our field exploration, trench excavations will likely encounter surface fill materials and coralline detritus

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materials generally consisting of very loose to very dense silty sand and gravel. In addition, hard coral formation and boulders may be encountered in the trench excavations.

It is anticipated that most of the material may be excavated with normal heavy excavation equipment. However, deep excavations and excavations encountering boulders and hard coral formation may require the use of hoerams. It should be noted that coral formations typically contain localized hard and crystallized zones. Therefore, we anticipate that some difficult excavation conditions may arise in localized areas during construction when the coral formation is encountered.

The contractor must exercise care to avoid over-ripping, which would disrupt the structure of the coral formation, resulting in a potential loss of bearing strength for improvements in the vicinity. Contractors should be encouraged to examine the site conditions and the subsurface data to make their own reasonable and prudent interpretation.

3.2.3 TRENCH EXCAVATION SUPPORT

We anticipate excavation depths on the order of about 7 to 8 feet below the existing ground surface will be required for the installation of the new drain lines. Where excavations greater than 5 feet in depth are planned, temporary shoring or sloping and benching should be used. Based on the results of our field exploration, these excavations may encounter very loose to very dense sandy soils with little to no cohesion. Therefore, the sides of open excavations will generally be unstable unless properly sloped or shored.

Based on our site observations, we believe that temporary cut slopes for open cut excavations may not be practical. Therefore, it appears the trench walls would have to be cut near vertical necessitating the use of shoring during construction.

The excavation support and shoring system used must comply with applicable safety requirements. The contractor should be solely responsible for the adequacy and safety of the shoring installation. The contractor's representative should be on-site at all times

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during excavation and construction work for the opportunity to promptly observe changing or unforeseen conditions, such as, high groundwater, inappropriate construction sequence or techniques, etc., which may affect the shoring stability.

Excavated soils should not be stockpiled closer than a horizontal distance equal to the depth of the excavation from the edge of the excavation to reduce the potential for excessive ground movement.

It is important to install adequate shoring and to maintain it tight against the excavation walls with proper bracing during construction. The properly braced shoring is essential to reduce the potential for appreciable lateral movements of the adjacent ground into the excavation, which may result in potential settlement or distress to adjacent structures or other improvements.

It must be noted that some minor movements of the shoring system and the adjacent ground may still occur due to changes in earth stresses during excavation. Due to the complexity of the stress changes, it is difficult to accurately estimate the magnitude of movement. The magnitude also depends greatly upon workmanship, such as how quickly and tightly the shoring and bracing supports are installed, the subsurface conditions, the size of the excavation, and the rate of excavation.

Therefore, it is important to realize that the excavation shoring should be installed properly and as early as practical. The adjacent ground should be continuously monitored for cracks, dips and/or other indications of movements with instruments until the trench excavations are finally backfilled.

3.2.4 PIPE BEDDING

The stress distribution against the bottom of a pipe has a significant effect on the load supporting capacity of the pipe. Therefore, the pipe bedding is an important design consideration. In general, we recommend providing granular bedding consisting of

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6 inches of open-graded gravel, such as No. 3 Fine gravel (ASTM C33, No. 67 gradation), under the pipes for uniform support.

In addition, open-graded gravel (ASTM C33, No. 67 gradation) should also be used for the initial trench backfill up to about 12 inches above the pipes (or groundwater level) to provide adequate support around the pipes. It is critical to use a free-draining material, such as open-graded gravel, to reduce the potential for formation of voids below the haunches of pipes and to provide adequate support for the sides of the pipes. Improper trench backfill could result in backfill settlement and pipe damage. Where groundwater is encountered, the bedding should be wrapped on all sides by non-woven filter fabric (Mirafi 180N or equivalent).

We envision soft and/or loose soils may be encountered at or near the invert elevations along portions of the new utility lines. Therefore, we recommend providing a subgrade stabilization layer consisting of 18 inches of No. 2 Rock (ASTM C 33, No. 4 gradation) or No. 3 Fine gravel (ASTM C33, No. 67 gradation) wrapped in a non-woven filter fabric (Mirafi 180N or equivalent) below the bedding layer for uniform support, if soft and/or loose soils are encountered. The stabilization layer should extend beyond the sides of the pipe a minimum width of one-fourth the outside diameter of the pipe or 12 inches, whichever is greater.

Before the placement of bedding material, a Kokua Geotech LLC representative should observe the excavated trench bottom to confirm that firm materials are exposed at the bottom of the trench or whether the installation of a stabilization layer is needed.

3.2.5 TRENCH BACKFILL

As discussed above, the first zone of backfill extending from the bedding material to at least 12 inches above the top of the pipes (or groundwater level) should consist of open-graded gravel, such as No. 3 Fine gravel (ASTM C33, No. 67 gradation) to reduce the compaction effort required and resulting stresses on the pipe.

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The trench backfill from 12 inches above the top of the pipes (or groundwater level) to the finished subgrade may consist of the excavated on-site soils provided that they are free of deleterious materials (vegetation) and are screened of particles greater than 3 inches in largest dimension.

Imported fill materials, if required, should consist of non-expansive structural fill material, such as crushed coral or basalt. The structural fill should be well-graded from coarse to fine with particles no larger than 3 inches in largest dimension. The material should have a CBR value of 20 or higher and a swell potential of 1 percent or less when tested in accordance with ASTM D1883. The material should also contain between 10 and 30 percent particles passing the No. 200 sieve.

3.2.6 TRENCH BACKFILL PLACEMENT AND COMPACTION REQUIREMENTS

The backfill materials consisting of the on-site soils should be moisture-conditioned to above the optimum moisture content, placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a minimum of 90 percent relative compaction. The upper 3 feet below the finished pavement grade in areas subjected to vehicular traffic should be compacted to a minimum of 95 percent relative compaction.

The backfill materials consisting of open-graded gravel, such as No. 3 Fine gravel (ASTM C33, No. 67 gradation), should generally be placed in level lifts not exceeding 8 inches in loose thickness and compacted to a firm surface.

Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined in accordance with ASTM D1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

3.2.7 SETTLEMENTS

Primary settlement of new drain lines are normally caused by the difference in the unit weight of the lighter excavated original earth and the heavier compacted backfill material

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placed over the pipes. The net increase in loading will cause settlement of the underlying subsoils below the trench invert. Based on our calculations, primary settlement on the order of less than 0.5 inches is anticipated for the project.

The above estimate assumes that proper construction procedures and good workmanship will be engaged during construction. Additional settlement could occur if improper trench support is used.

3.3 DEWATERING

During our field exploration, we encountered groundwater in the boring near Kahauiki Stream B (Boring No. 5) at a depth of about 5 feet below the existing ground surface at the time of our field exploration. Due to the relatively shallow groundwater level encountered at the project site, we anticipate that the piping to be installed may extend below the groundwater level. Therefore, dewatering of the excavation may be necessary for this installation.

In general, dewatering operations should be conducted in such a manner that dewatering will not cause areal ground subsidence, which may cause potential damage to the nearby existing structures. Therefore, consideration should be given to a dewatering system that includes a cut-off wall to reduce the volume of water to be removed within the excavation and to reduce the areal extent of groundwater drawdown outside of the excavation.

Because the excavation dewatering may involve the discharge of groundwater from the dewatering operation into adjacent drainage systems, a National Pollutant Discharge Elimination System (NPDES) permit may be necessary. The contractor should consult their independent consultant or the State of Hawaii, Department of Health for the latest regulations and information pertaining to the NPDES permit application.

Based on the results of our field exploration, we anticipate the project site at Kahauiki Stream B is generally underlain by surface fill materials and coralline detritus materials consisting of very loose to very dense silty sand and gravel extending down to the maximum depth explored of about 18 feet below the existing ground surface. Due to the heterogeneous nature of these

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materials, the actual subsurface soil permeability may range broadly and also vary locally in terms of orders of magnitude. The permeability of the subsurface materials at the sites may be considered highly permeable based on the materials encountered. Therefore, the contractor should pay special attention to the site-specific dewatering plan for the proposed excavations.

3.4 DESIGN REVIEW AND CONSTRUCTION OBSERVATION SERVICES

The construction plans and specifications for the project should be forwarded to us for review to determine whether the recommendations contained in this report are adequately reflected in those documents. If this review is not made, Kokua Geotech LLC cannot assume responsibility for misinterpretation of our recommendations.

Kokua Geotech LLC should also be retained to monitor the site grading, drain line installation operations, and other aspects of earthwork construction to determine whether the recommendations of this report are followed. The recommendations presented herein are contingent upon such observations. If the actual exposed subsurface soil conditions encountered during construction differ from those assumed or considered in this report, Kokua Geotech LLC should be contacted to review and/or revise the geotechnical recommendations presented herein.

END OF DISCUSSION AND RECOMMENDATIONS

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SECTION 4.0 LIMITATIONS

This report has been prepared for the exclusive use of Okahara and Associates, Inc. and their project consultants for specific application to the design of the *Kahauiki Stream Maintenance Dredging, Phase 2* project in accordance with generally accepted geotechnical engineering principles and practices. No warranty is expressed or implied. If any part of the project concept is altered or if subsurface conditions differ from those described in this report, then the information presented herein shall be considered invalid, unless the changes are reviewed, and any supplemental or revised recommendations issued in writing by Kokua Geotech LLC.

The analyses and report recommendations are based in part upon information obtained from the field borings and the assumption that subsurface conditions do not vary significantly from those observed in the borings. Variations of the subsurface conditions between and beyond the field borings may occur, and the nature and extent of these variations may not become evident until construction is underway. If variations then appear evident, Kokua Geotech LLC should be notified so that we can re-evaluate the recommendations presented herein.

The owner/client should be aware that unanticipated soil conditions are commonly encountered. Unforeseen subsurface conditions, such as perched groundwater, soft deposits, hard layers or cavities, may occur in localized areas and may require additional probing or corrections in the field (which may result in construction delays) to attain a properly constructed project. Therefore, a sufficient contingency fund is recommended to accommodate these possible extra costs.

The field boring locations indicated herein are approximate, having been estimated by taping from visible features shown on a Topographic Survey Plan transmitted by Okahara & Associates, Inc. on July 25, 2023. The elevations of the borings were estimated from contours and spot elevations shown on the same plan. The field boring locations and elevations should be considered accurate only to the degree implied by the methods used.

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The stratification breaks shown on the graphic representations of the borings depict the approximate boundaries between soil types and, as such, may denote a gradual transition. Water level data from the borings were measured at the time of drilling. Considering the proximity of the project site to Kahauiki Stream and the Pacific Ocean, groundwater levels are anticipated to vary in response to the water level in the stream and tidal fluctuation. In addition, groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors. These data have been reviewed and interpretations made in the formulation of this report.

This report has been prepared solely for the purpose of assisting the design engineers in the design of the project. Therefore, this report may not contain sufficient data, or the proper information, to serve as a basis for detailed construction cost estimates.

This geotechnical engineering exploration conducted at the project site was not intended to investigate the potential presence of hazardous materials existing at the project site. It should be noted that the equipment, techniques, and personnel used to conduct a geo-environmental exploration differ substantially from those applied in geotechnical engineering.

END OF LIMITATIONS

Attachment G: State Department of Health, Clean Water Branch Section 401

CLOSURE

The following plates and appendices are attached and complete this report:

Project Location Map ..... Plate 1

Site Plans ..... Plates 2.1 and 2.2

Site Photographs ..... Plates 3.1 through 3.3

Logs of Borings ..... Appendix A

Laboratory Test Results ..... Appendix B

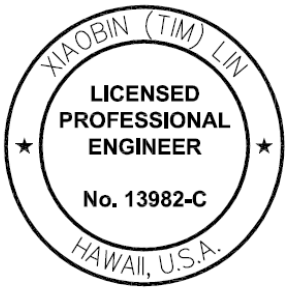
Photographs of Rock Core Samples ..... Appendix C

This report concludes our scope of work outlined in our revised fee proposal dated September 1, 2022. If you have any questions regarding this report or if any part of the report is not clear, please contact our office.

Respectfully submitted,

Kokua Geotech LLC

Xiaobin (Tim) Lin, P.E.
President



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
(MY LICENSE EXPIRES 4/30/2024)

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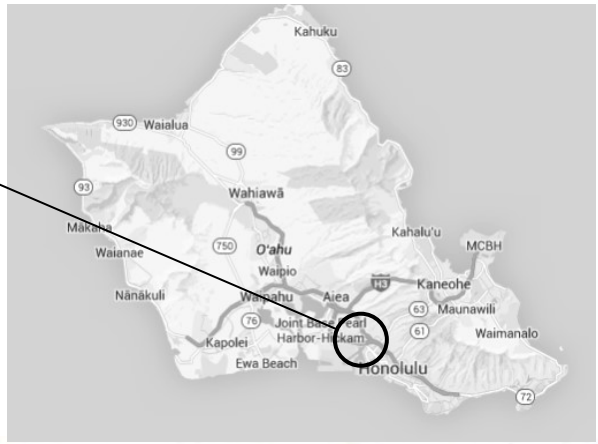
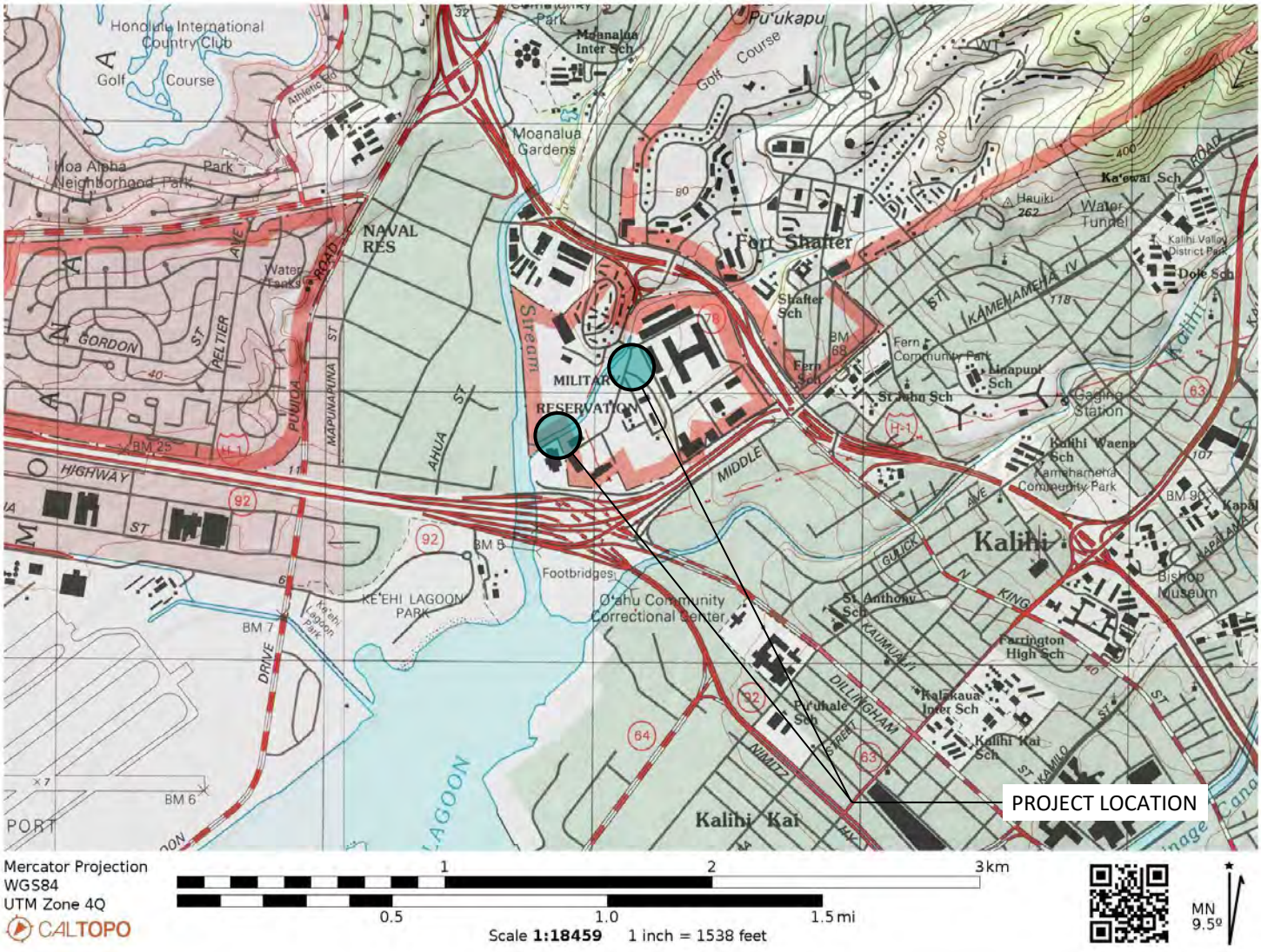
PLATES

Attachment G: State Department of Health, Clean Water Branch Section 401

GENERAL PROJECT LOCATION





Mercator Projection
WGS84
UTM Zone 4Q
CALTOPO

1 2 3km
0.5 1.0 1.5 mi
Scale **1:18459** 1 inch = 1538 feet

MN 9.5º

PROJECT LOCATION MAP

KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2
FORT SHAFTER FLATS
HONOLULU, OAHU, HAWAII

Kokua Geotech LLC
Soil and Foundation Engineering

PROJECT NO.: 082922-00	**PLATE** 1
DATE: JULY 2023	

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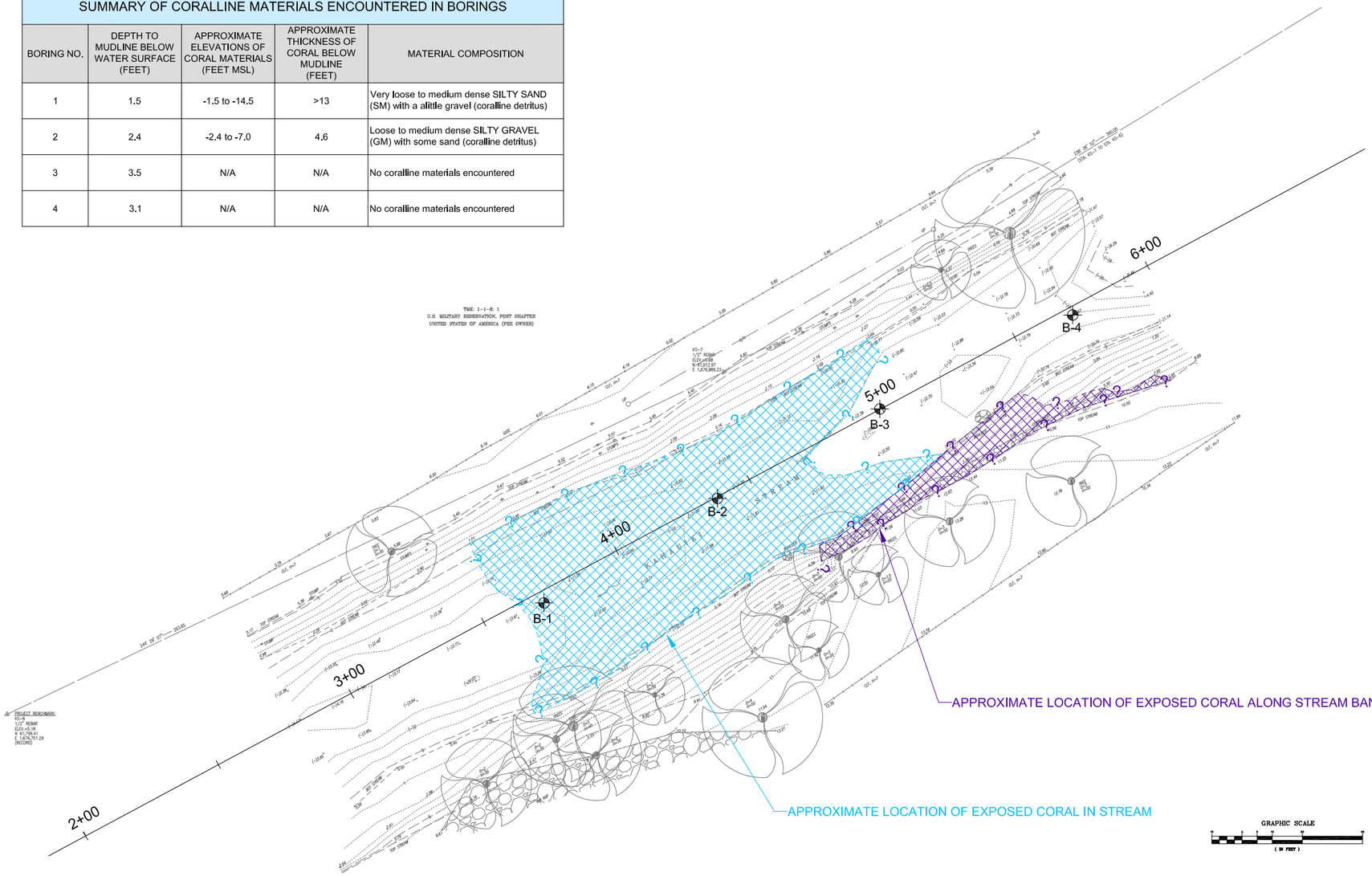
SUMMARY OF CORALLINE MATERIALS ENCOUNTERED IN BORINGS				
BORING NO.	DEPTH TO MUDLINE BELOW WATER SURFACE (FEET)	APPROXIMATE ELEVATIONS OF CORAL MATERIALS (FEET MSL)	APPROXIMATE THICKNESS OF CORAL BELOW MUDLINE (FEET)	MATERIAL COMPOSITION
1	1.5	-1.5 to -14.5	>13	Very loose to medium dense SILTY SAND (SM) with a alittle gravel (coralline detritus)
2	2.4	-2.4 to -7.0	4.6	Loose to medium dense SILTY GRAVEL (GM) with some sand (coralline detritus)
3	3.5	N/A	N/A	No coralline materials encountered
4	3.1	N/A	N/A	No coralline materials encountered



APPROXIMATE BORING LOCATION

Kokua Geotech LLC
Soil and Foundation Engineering

PROJECT:
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2

TITLE:
SITE PLAN - 1

DATE:	PROJECT NO.:	PLATE NO.:
JULY 2023	082922-00	2.1

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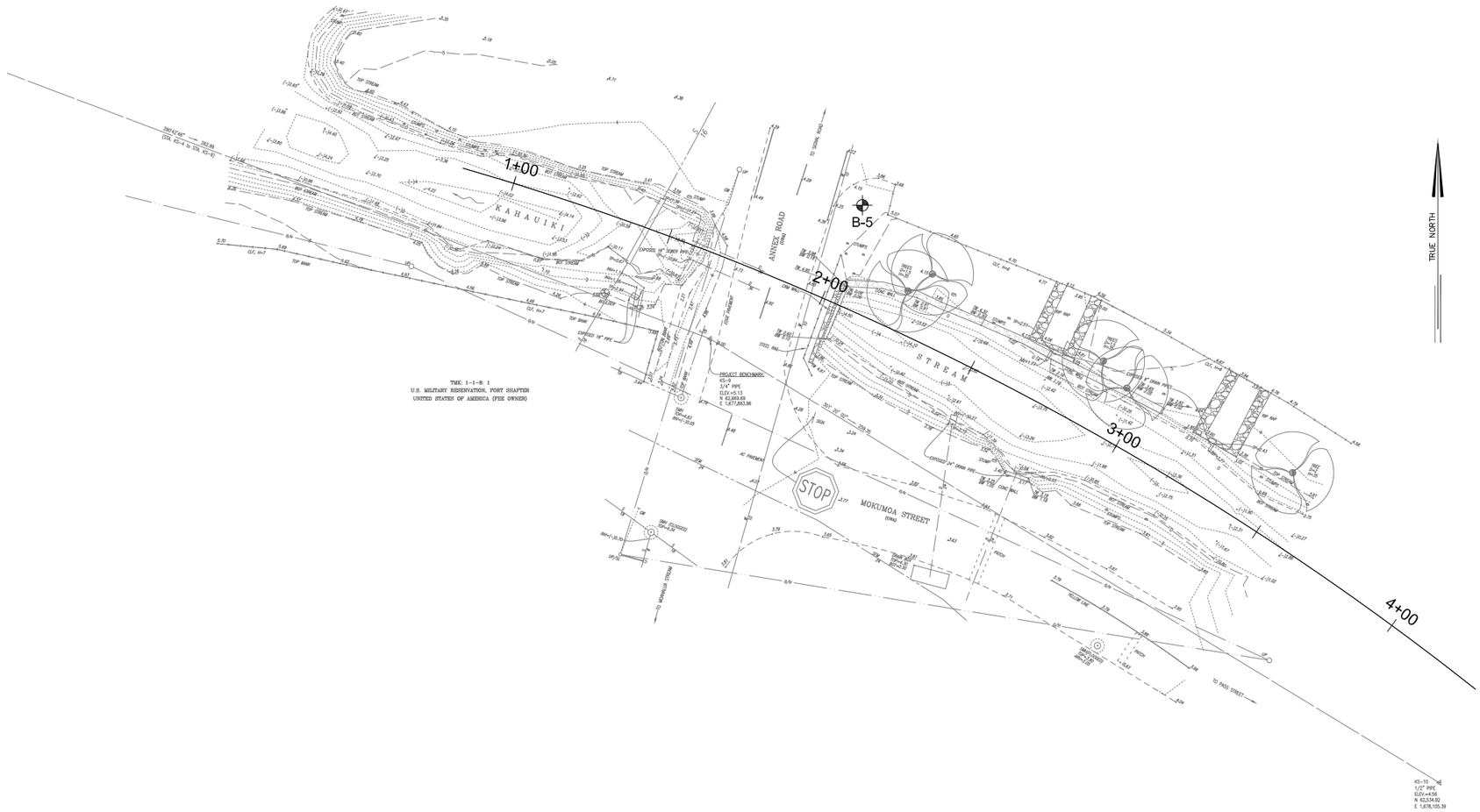

APPROXIMATE BORING LOCATION

Kokua Geotech LLC
Soil and Foundation Engineering

PROJECT: KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2		
TITLE: SITE PLAN - 2		
DATE: JULY 2023	PROJECT NO.: 082922-00	PLATE NO.: 2.2

Attachment G: State Department of Health, Clean Water Branch Section 401

Photograph No. 1: View of exposed coralline materials in stream (June 28, 2023)

Photograph No. 2: View of exposed coralline materials in stream and along stream bank (June 28, 2023)

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Photograph No. 3: View of exposed coralline materials in stream (June 28, 2023)

Photograph No. 4: View of exposed coralline materials in stream (June 28, 2023)

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Photograph No. 5: View of exposed coralline materials in stream and along stream bank (June 29, 2023)

Photograph No. 6: View of exposed coralline materials along stream bank (June 29, 2023)

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APPENDIX A

Attachment G: State Department of Health, Clean Water Branch Section 401

Project: Kahauiki Stream Maintenance Dredging, Ph. 2 Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii Project Number: 082922-00	**Kokua Geotech LLC** 94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Key to Logs of Borings Sheet 1 of 1

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Core Recovery, %	RQD, %	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
1	2	3	4	5	6	7	8	9	10	11	12	13	14

COLUMN DESCRIPTIONS

1. Elevation (feet): Elevation (MSL, feet).
2. Depth (feet): Depth in feet below the ground surface.
3. Sample Type: Type of soil sample collected at the depth interval shown.
4. Sample Number: Sample identification number.
5. Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
6. Core Recovery, %: , expressed as the amount of recovered material divided by the total length of the core run (presented as a percentage).
7. RQD, %: , expressed as a modified core recovery in which the lengths of all sound rock core piece over 4 inches in length are summed and divided by the length of the core run.
8. U.S.C.S: Type of material encountered.
9. Graphic Log: Graphic depiction of the subsurface material encountered.
10. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
11. Pocket Pen./Torvane, tsf: the reading from Poecket Penetrometer or Torvane.
12. Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
13. Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
14. Remarks and Other Tests: Other Tests

FIELD AND LABORATORY TEST ABBREVIATIONS

CORR: Corrosivisty tests to assess soil corrosivity
WOR: Weight of Rods
WOH: Weight of Hammer
CONS: One-dimensional consolidation test

LL: Liquid Limit, percent
PI: Plasticity Index, percent
SPT: Standard Penetration Test
UC: Unconfined Compression
MCS: Modified California Sampler

MATERIAL GRAPHIC SYMBOLS

- Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
- Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
- Silty GRAVEL (GM)
- Clayey SAND (SC)
- Silty SAND (SM)
- Water

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Auger sampler
- Bulk Sample
- 3-inch-OD California w/ brass rings
- CME Sampler
- Grab Sample
- HQ Coring
- 3-inch OD Modified California w/ brass liners
- Pitcher Sample
- PQ Coring
- Probing w/Pointed Tip
- 2-inch-OD unlined split spoon (SPT)
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

PLATE A-0.1

Attachment G: State Department of Health, Clean Water Branch Section 401

Project: Kahauiki Stream Maintenance Dredging, Ph. 2 Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii Project Number: 082922-00	**Kokua Geotech LLC** 94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 1 Sheet 1 of 1

Date(s) Drilled **6/28/23**	Logged By **AJF**	Checked By **AJF**
Drilling Method **HQ Coring**	Drill Bit Size/Type **HQ-Size Coring**	Total Depth of Borehole **14.5 feet**
Drill Rig Type **Lonestar Track Drill**	Drilling Contractor **Kokua Geotech LLC**	Approximate Surface Elevation **+0 feet MSL (Mudline -1.5 feet)**
Groundwater Level and Date Measured **N/A**	Sampling Method(s) **MCS, SPT & HQ-Coring**	Hammer Data **140 lbs. with 30-inch drop**
Borehole Backfill **N/A**	Location **See Site Plan - 1 (Plate 2.1)**	

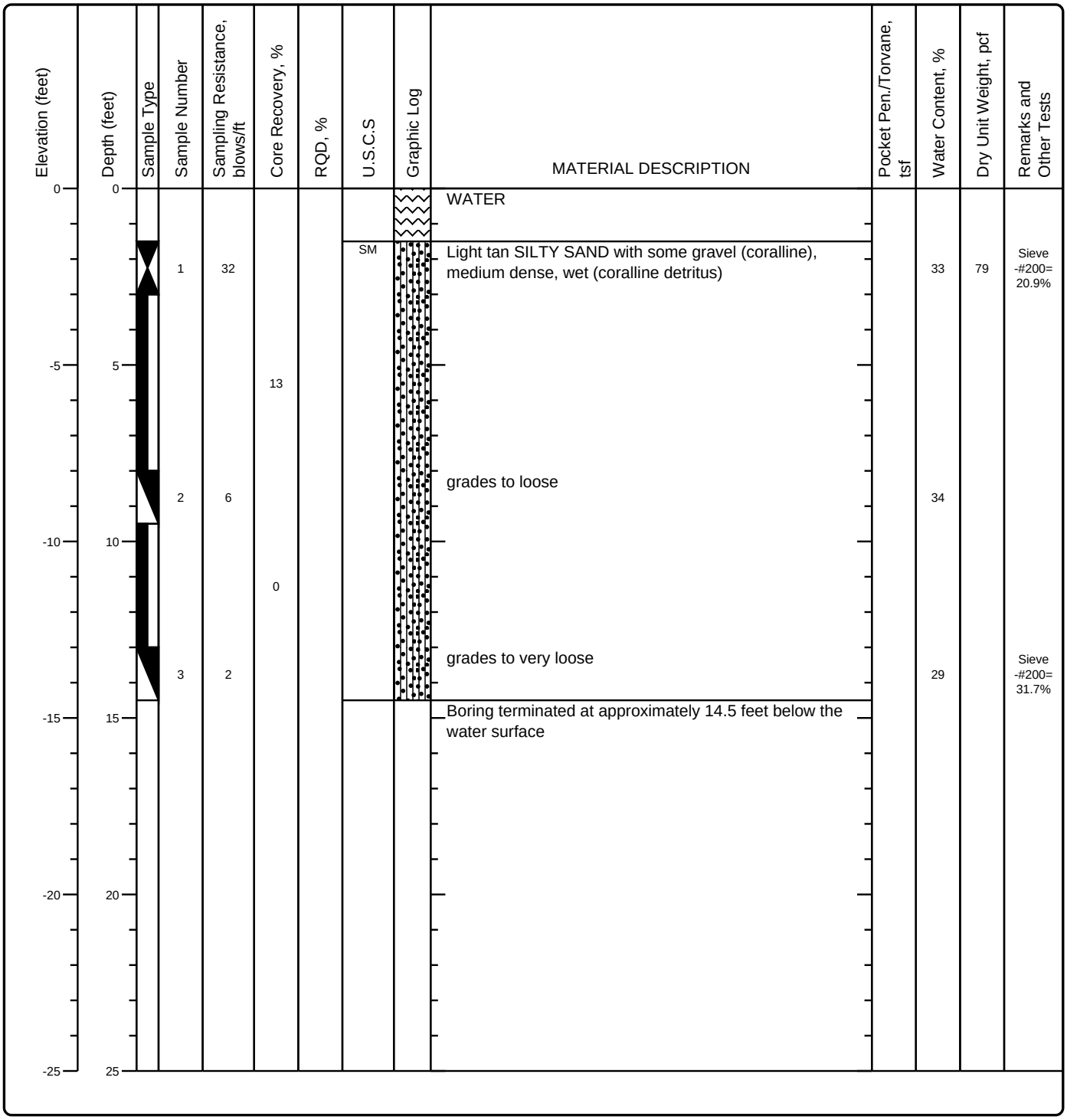


PLATE A-1

Attachment G: State Department of Health, Clean Water Branch Section 401

Project: Kahauiki Stream Maintenance Dredging, Ph. 2 Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii Project Number: 082922-00	**Kokua Geotech LLC** 94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 2 Sheet 1 of 1

Date(s) Drilled **6/28/23**	Logged By **AJF**	Checked By **AJF**
Drilling Method **HQ Coring**	Drill Bit Size/Type **HQ-Size Coring**	Total Depth of Borehole **10.0 feet**
Drill Rig Type **Lonestar Track Drill**	Drilling Contractor **Kokua Geotech LLC**	Approximate Surface Elevation **+0 feet MSL (Mudline -2.4 feet)**
Groundwater Level and Date Measured **N/A**	Sampling Method(s) **MCS, SPT & HQ-Coring**	Hammer Data **140 lbs. with 30-inch drop**
Borehole Backfill **N/A**	Location **See Site Plan - 1 (Plate 2.1)**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Core Recovery, %	RQD, %	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
0	0								WATER				
							GM		Grayish tan SILTY GRAVEL (coralline) with some sand, medium dense, wet (coralline detritus)		16	99	
			1	28					grades loose to medium dense				
-5	5		2	10							19		
					0								
							SC		Brown with dark gray mottling CLAYEY SAND, medium dense, wet (alluvium)				
			3	11							49		LL=65, PI=34
-10	10								Boring terminated at approximately 10.0 feet below the water surface				
-15	15												
-20	20												
-25	25												

PLATE A-2

Attachment G: State Department of Health, Clean Water Branch Section 401

Project: Kahauiki Stream Maintenance Dredging, Ph. 2 Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii Project Number: 082922-00	**Kokua Geotech LLC** 94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 3 Sheet 1 of 1

Date(s) Drilled **6/29/23**	Logged By **AJF**	Checked By **AJF**
Drilling Method **HQ Coring**	Drill Bit Size/Type **HQ-Size Coring**	Total Depth of Borehole **10.5 feet**
Drill Rig Type **Lonestar Track Drill**	Drilling Contractor **Kokua Geotech LLC**	Approximate Surface Elevation **+0 feet MSL (Mudline -3.5 feet)**
Groundwater Level and Date Measured **N/A**	Sampling Method(s) **MCS, SPT & HQ-Coring**	Hammer Data **140 lbs. with 30-inch drop**
Borehole Backfill **N/A**	Location **See Site Plan - 1 (Plate 2.1)**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Core Recovery, %	RQD, %	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
0	0								WATER				
							CL		Brown SANDY CLAY, medium stiff, wet (alluvium)	0.75	64	69	
-5	5		1	11					grades to stiff				
			2	9	0						60		Sieve -#200= 80.0%
-10	10		3	12							53		
									Boring terminated at approximately 10.5 feet below the water surface				
-15	15												
-20	20												
-25	25												

PLATE A-3

Attachment G: State Department of Health, Clean Water Branch Section 401

Project: Kahauiki Stream Maintenance Dredging, Ph. 2 Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii Project Number: 082922-00	**Kokua Geotech LLC** 94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 4 Sheet 1 of 1

Date(s) Drilled **6/29/23**	Logged By **AJF**	Checked By **AJF**
Drilling Method **HQ Coring**	Drill Bit Size/Type **HQ-Size Coring**	Total Depth of Borehole **10.0 feet**
Drill Rig Type **Lonestar Track Drill**	Drilling Contractor **Kokua Geotech LLC**	Approximate Surface Elevation **+0 feet MSL (Mudline -3.1 feet)**
Groundwater Level and Date Measured **N/A**	Sampling Method(s) **MCS, SPT & HQ-Coring**	Hammer Data **140 lbs. with 30-inch drop**
Borehole Backfill **N/A**	Location **See Site Plan - 1 (Plate 2.1)**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Core Recovery, %	RQD, %	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
0	0								WATER				
			1	12			CL		Brown SANDY CLAY, medium stiff, wet (alluvium)	0.5	60	74	Sieve -#200= 54.5%
-5	5		2	4					grades soft to medium stiff		57		
					0		CH		Brown with dark gray mottling SILTY CLAY with some sand and traces of gravel, stiff, wet (alluvium)				
			3	12							49		LL=96, PI=58
-10	10								Boring terminated at approximately 10.0 feet below the water surface				
-15	15												
-20	20												
-25	25												

PLATE A-4

Attachment G: State Department of Health, Clean Water Branch Section 401

Project: Kahauiki Stream Maintenance Dredging, Ph. 2 Project Location: Fort Shafter Flats, Honolulu, Oahu, Hawaii Project Number: 082922-00	**Kokua Geotech LLC** 94-974 Pakela St., Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 5 Sheet 1 of 1

Date(s) Drilled **2/10/23**	Logged By **JW**	Checked By **AJF**
Drilling Method **CF Auger**	Drill Bit Size/Type **6-inch Hollow Stem Auger**	Total Depth of Borehole **21.5 feet**
Drill Rig Type **Diedrich D-25**	Drilling Contractor **Kokua Geotech LLC**	Approximate Surface Elevation **+4.5 feet MSL***
Groundwater Level and Date Measured **5.0 feet @ 11:04 AM 2/10/23**	Sampling Method(s) **MCS & SPT**	Hammer Data **140 lbs. with 30-inch drop**
Borehole Backfill **Soil Cuttings and Gravel**	Location **See Site Plan - 2 (Plate 2.2)**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Core Recovery, %	RQD, %	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
4.5	0						SM		Light tan SILTY SAND with some gravel (coralline), very dense, dry to moist (fill)				
			1	94							10	101	
			2	40					grades to dense		18		Sieve -#200= 12.1%
-0.5	5						GM		Gray and light tan SILTY GRAVEL (coralline) with sand, very dense, wet (coralline detritus)				
			3	56/9" +10/0" Ref.							16	118	
							SM		Dark tan SILTY SAND with some gravel (coralline), very loose, wet (coralline detritus)				
-5.5	10		4	3							23		
-10.5	15		5	6							55	72	
							CH		Dark gray SILTY CLAY with sand, soft to medium stiff, wet (alluvium)				
-15.5	20		6	4							48		LL=55, PI=31
									Boring terminated at approximately 21.5 feet below the existing ground surface *Elevation of boring estimated from Topographic Survey Plan transmitted by Okahara and Associates, Inc. on July 25, 2023				
-20.5	25												

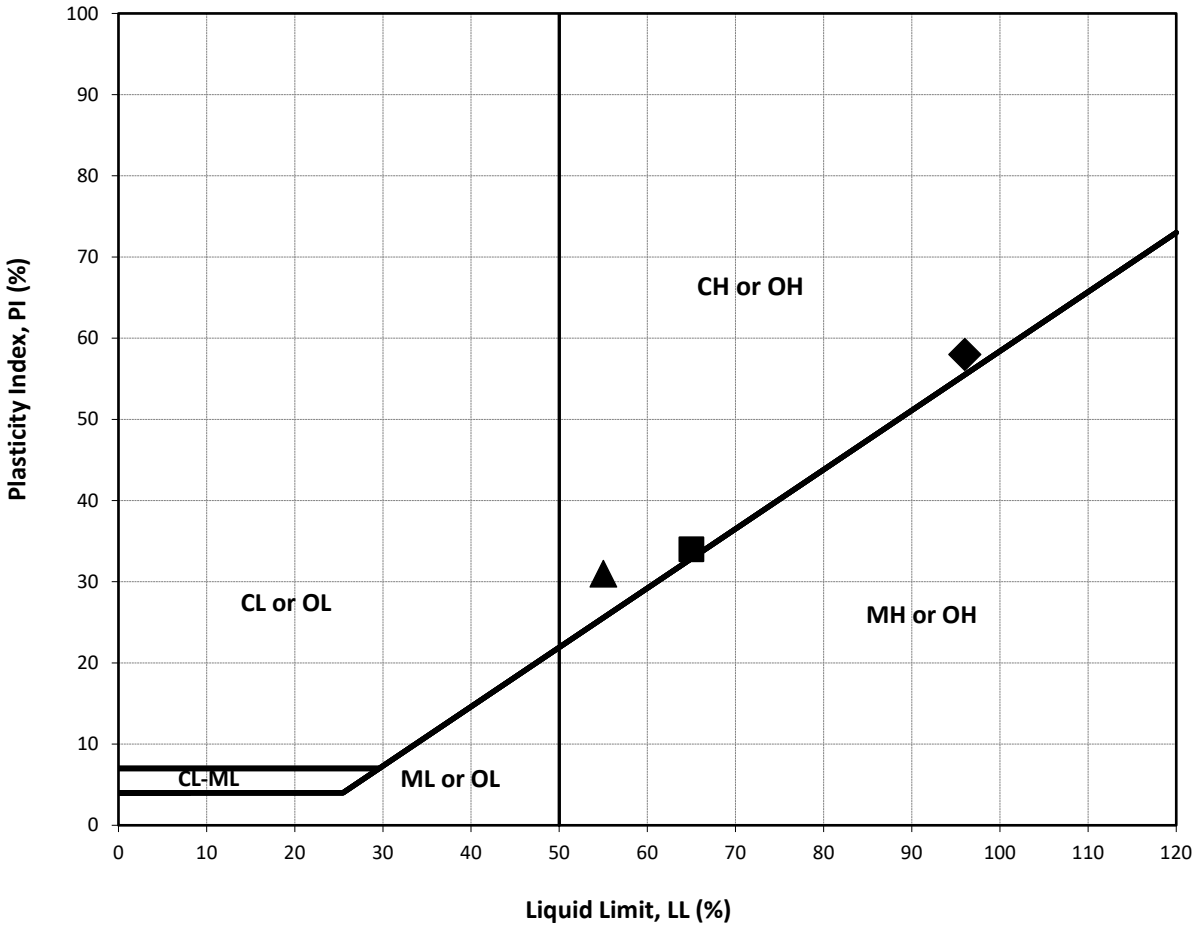
PLATE A-5

Attachment G: State Department of Health, Clean Water Branch Section 401

APPENDIX B

Attachment G: State Department of Health, Clean Water Branch Section 401

PLASTICITY CHART



Symbol	Sample	Depth (feet)	Material Description	USCS	LL	PL	PI
■	B-2	8.0 to 9.0	Brown w/dark gray mott. CLAYEY SAND	SC	65	31	34
◆	B-4	8.0 to 9.0	Brown w/dark gray mott. SILTY CLAY with some sand	CH	96	38	58
▲	B-5	20.0 to 21.5	Dark gray SILTY CLAY with a little sand	CH	55	24	31

SUMMARY OF ATTERBERG LIMITS (ASTM D4318) TEST RESULTS

Kokua Geotech LLC
Soil and Foundation Engineering

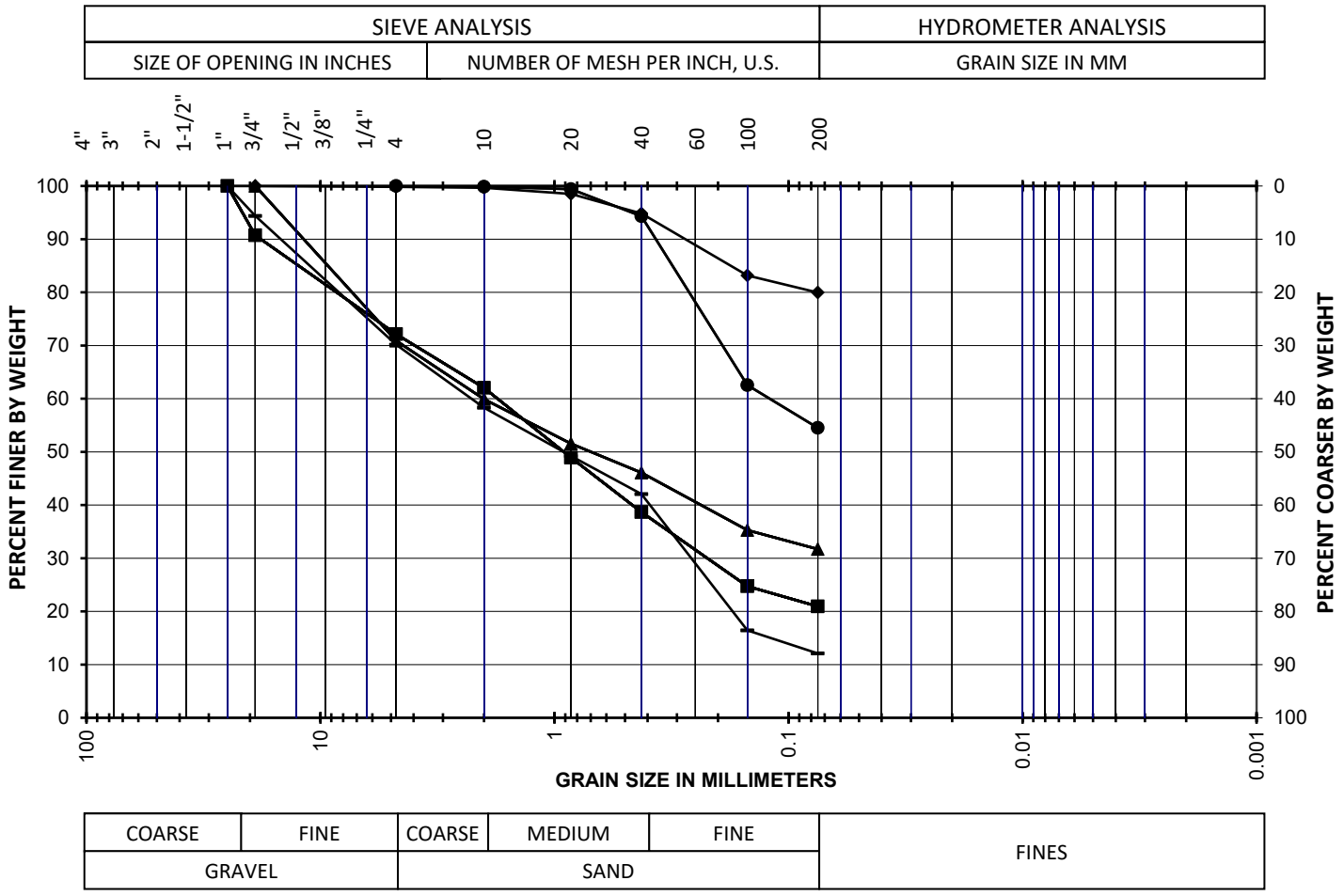
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2
FORT SHAFTER FLATS
HONOLULU, OAHU, HAWAII

PROJECT NO.: 082922-00

DATE: JULY 2023

PLATE
B-1

Attachment G: State Department of Health, Clean Water Branch Section 401



Symbol	Sample	Depth (feet)	USCS	Description
■	B-1	1.5 to 3.0	SM	Light tan SILTY SAND with some gravel
▲	B-1	13.0 to 14.5	SM	Light tan SILTY SAND with some gravel
◆	B-3	5.0 to 6.5	CL	Brown SANDY CLAY
●	B-4	3.0 to 4.5	CL	Brown SANDY CLAY
—	B-5	2.5 to 4.0	SM	Light tan SILTY SAND with some gravel

SUMMARY OF GRAIN SIZE DISTRIBUTION (ASTM C117 & C136) TEST RESULTS

Kokua Geotech LLC
Soil and Foundation Engineering

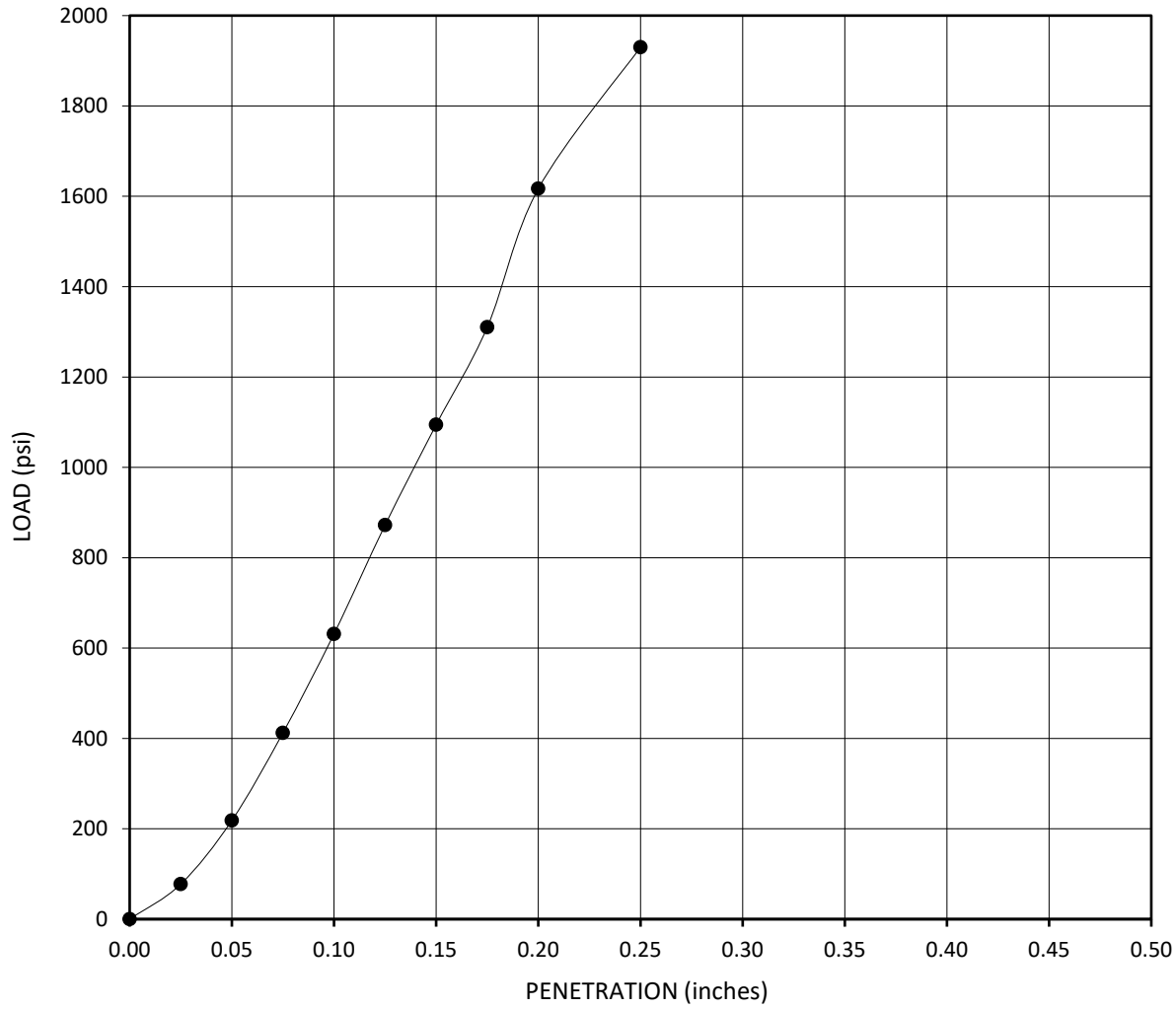
KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2
FORT SHAFTER FLATS
HONOLULU, OAHU, HAWAII

PROJECT NO.: 082922-00

DATE: JULY 2023

PLATE
B-2

Attachment G: State Department of Health, Clean Water Branch Section 401



Location:	BULK-1 (Cuttings from B-5)
Depth:	0.0 to 2.0 feet
Description:	Light tan SILTY SAND with some gravel

Molding Dry Density:	114.3 pcf		
Molding Moisture:	12.1 %	**Corrected CBR @ 0.1":**	90.1
Days Soaked:	5	**Corrected CBR @ 0.2":**	119.4
Aggregate:	¾-inch minus	**Swell (%):**	0.0

SUMMARY OF CALIFORNIA BEARING RATIO (ASTM D1883) TEST RESULTS

KAHAUIKI STREAM MAINTENANCE DREDGING, PHASE 2
FORT SHAFTER FLATS
HONOLULU, OAHU, HAWAII

Kokua Geotech LLC
Soil and Foundation Engineering

PROJECT NO.: 082922-00

DATE: JULY 2023

PLATE
B-3

Attachment G: State Department of Health, Clean Water Branch Section 401

APPENDIX C

Attachment G: State Department of Health, Clean Water Branch Section 401

BORING NO. 1 – 3 TO 8 FEET

Attachment G: State Department of Health, Clean Water Branch Section 401

BORING NO. 2 – 5.5 TO 8 FEET

Attachment G: State Department of Health, Clean Water Branch Section 401

Outlook

RE: POH-2017-00079 Request for Information

From Gallagher, Connor C CIV USARMY CEPOH (USA) <Connor.C.Gallagher@usace.army.mil>
Date Fri 2/7/2025 1:51 PM
To William Bow <wbow@kahewai.com>
Cc Martin, Jennifer L (Jen) CIV USARMY CEPOH (USA) <Jennifer.L.Martin@usace.army.mil>; Lara, Kirsten F CIV USARMY CEPOH (USA) <Kirsten.F.Lara@usace.army.mil>

1 attachment (51 KB)
PCN Eng_Form_6082_2022Sep.pdf;

Aloha Mr. Bow,

I got your message from Kirsten, who will likely take over the processing of this application. My supervisor, Jen Martin, also copied on this email, looked a little closer at the information provided and realized it would be beneficial for the army tro break this project up into two applications. One would be a Nationwide Permit application for maintenance for the discharges associated with the culvert portion of the project along “Kahuiki Stream B”. The other could go a couple different ways depending on if that lower portion of the Kahuiki Stream is tidal, or not. My supervisor wanted me to reach out to see if you would be available for a pre-application meeting on either Monday or Wednesday of next week with her and Ms. Lara. Please respond here if you have availability then and either Ms. Lara or Ms. Martin will reach out to set up the final meeting time.

Thank you for reaching out so quickly after my request for information. I’ll try again to call this afternoon before I leave the office so that we can talk some things through.

Mahalo,

Connor Gallagher
Biologist, Regulatory Specialist | Regulatory Division |

U.S. Army Corps of Engineers | Honolulu District
230 Otake Street, Fort Shafter, Hawaii 96858-5440
Direct Cell: 808-458-2415 | Main Line: 808-835-4303
Connor.C.Gallagher@usace.army.mil
https://www.poh.usace.army.mil/Missions/Regulatory/

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rrs.usace.army.mil
[rrs.usace.army.mil]

From: William Bow <wbow@kahewai.com>
Sent: Friday, February 7, 2025 7:50 AM

Attachment G: State Department of Health, Clean Water Branch Section 401

To: Gallagher, Connor C CIV USARMY CEPOH (USA) <Connor.C.Gallagher@usace.army.mil>
Subject: [Non-DoD Source] Re: POH-2017-00079 Request for Information

Hi Connor,

I am going to try to give you a call later this morning. I started to draft an email, but then if was going to be too wordy. I don't think we'll have you all your answers prior to your leave, so I just want to make sure we are moving in the right direction to best help the next person taking over this project.

Let me know if there is a best time to call.

Thanks,

William F. Bow, M.S.
Principal Investigator

2855 East Manoa Road, Suite 105, #316
Honolulu, Hawaii 96822

Direct: 808-371-0676
www.kahewai.com

Book time to meet with me

KAHEWAI
ENVIRONMENTAL

This message is intended solely for the recipient identified above and should not be opened, read, or utilized by any other party. This message is intended above and shall not be construed as official project information or direction except as expressly provided in the contract documents.

From: William Bow <wbow@kahewai.com>
Sent: Wednesday, February 5, 2025 9:54 AM
To: Gallagher, Connor C CIV USARMY CEPOH (USA) <Connor.C.Gallagher@usace.army.mil>; Gainey, Nisit Anthony (Tony) CIV USARMY IMCOM PACIFIC (USA) <nisit.a.gainey.civ@army.mil>
Cc: Matthew Fujioka <mfujioka@okahara.com>
Subject: Re: POH-2017-00079 Request for Information

Thank you, Mr. Gallagher. I'll be looking at your response and letter more carefully today and hopefully get back to you before your leave.

William F. Bow, M.S.
Principal Investigator

2855 East Manoa Road, Suite 105, #316
Honolulu, Hawaii 96822

Direct: 808-371-0676
www.kahewai.com

Book time to meet with me

KAHEWAI
ENVIRONMENTAL

This message is intended solely for the recipient identified above and should not be opened, read, or utilized by any other party. This message is intended above and shall not be construed as official project information or direction except as expressly provided in the contract documents.

From: Gallagher, Connor C CIV USARMY CEPOH (USA) <Connor.C.Gallagher@usace.army.mil>
Sent: Tuesday, February 4, 2025 12:54 PM
To: Gainey, Nisit Anthony (Tony) CIV USARMY IMCOM PACIFIC (USA) <nisit.a.gainey.civ@army.mil>; William Bow <wbow@kahewai.com>
Subject: POH-2017-00079 Request for Information

Aloha,

I have been reviewing your application and have some pieces of information we need to consider your application complete. Please see the attached documents for further detail.

Also, please not that I will be starting on extended leave starting February 10th at which time another regulator will take over this project. Please send your response to this request for information to the general inbox CEPOH-RO@usace.army.mil if it is sent after February 10, 2025.

Mahalo,

Connor Gallagher
Biologist, Regulatory Specialist | Regulatory Division |

U.S. Army Corps of Engineers | Honolulu District

230 Otake Street, Fort Shafter, Hawaii 96858-5440
Direct Cell: 808-458-2415 | Main Line: 808-835-4303

Connor.C.Gallagher@usace.army.mil

https://www.poh.usace.army.mil/Missions/Regulatory/

Attachment G: State Department of Health, Clean Water Branch Section 401

[rrs.usace.army.mil]

Attachment G: State Department of Health, Clean Water Branch Section 401