

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:

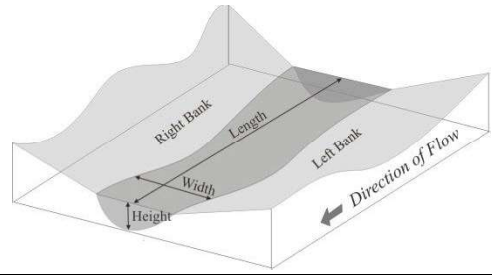
11. Project Site Location(s): Provide site coordinates of downstream-most point of project in degrees, minutes, seconds (NAD83).

Latitude: 22° 3' 56.2104" Longitude: -159° 25' 14.5488" Elevation: 543 ft. above mean sea level

12. Structure Dimensions: (feet)

Width:	105
Height:	7.5
Length:	45
Diameter:	N/A

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



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 if a CDUP is required.

- Stream channel alteration is in a Conservation District.
 Required. CDUP #: pending Date CDUP approved: pending; see Attachment 7 request submitted to OCCL.
 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 SHPD. If the affected parcel(s) has not undergone SHPD 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. **SHPD reviewing HICRIS submittal 2023PR00658, submitted on 5/23/2023. See Attachment 2.**
 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: _____

Project determined to qualify for exemption (see Attachment 4). Notice of exemption will be published in the DLNR June 2023 Exemption List in the July 8, 2023 Environmental Notice.

This project proposes:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Use of state or county lands, or use of state or county funds | <input type="checkbox"/> A wastewater treatment unit |
| <input checked="" type="checkbox"/> Use within a state conservation district | <input type="checkbox"/> Waste-to-energy facility |
| <input type="checkbox"/> Use within a shoreline setback area | <input type="checkbox"/> Landfill |
| <input type="checkbox"/> Use within a national or Hawaii registered historic site | <input type="checkbox"/> Oil refinery |
| <input type="checkbox"/> Use within the Waikiki Special District | <input type="checkbox"/> Power-generating facility |
| <input type="checkbox"/> The construction, expansion or modification of helicopter facility | <input type="checkbox"/> 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.

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

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.

An archaeological literature review and field investigation (LRFI) was performed for the proposed project site and other sites under consideration for repair. No historic properties or cultural deposits were identified in the vicinity of the Queensland low-water crossing (Attachment 2). Several basalt and cobble alignments and stacks were observed in the stream, but the alignments were assessed as modern construction, and the stacks as natural sorting created by hydrology. As the alignments were not present during an earlier visit to the site by an Haley & Aldrich wetland scientist, they were most likely placed by visitors to the forest reserve, and may have been intended as repairs to the damaged crossing.

The study indicated that, given the nature, location and scope of work proposed, it is highly unlikely that any historic properties will be identified and/or negatively impacted or disturbed during the proposed work on this property. It further stated that, as a result of these findings, no further work related to archaeological resources is recommended for this project. The field investigation report is provided in Attachment 2.

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

As noted above, findings of the LRFI indicated that, given the nature, location and scope of work proposed, it is highly unlikely that any historic properties will be identified and/or negatively impacted or disturbed during the proposed work on this property (Attachment 2). The only native stream life of importance to traditional and customary Native Hawaiian rights that is documented to occur at or above the project site is the 'opae kalaole or mountain shrimp (*Atyoida bisulcata*). The project will be constructed with box culverts that will provide continued upstream and downstream migration of 'opae. The project will restore access to the upper the upper Līhu'e-Kōloa Forest Reserve, allowing traditional and customary Native Hawaiian rights within the extent of the Reserve.

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

The proposed Queensland Low-Water Crossing repair project will have no an adverse effect on Native Hawaiian rights; therefore, no action is required. The project will restore access to this area of the Līhu'e-Kōloa Forest Reserve, providing a benefit to the community.

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.

The Līhu'e-Kōloa Forest Reserve (Reserve) is managed by the Department of Land and Natural Resources (DLNR). Access to the Wailua section of the Reserve is via the Wailua Forest Management Road. During historic 2018 and 2020 flood events, the Reserve low-water crossings and other locations along the Wailua Forest Management Road were severely damaged, limiting public access to the Reserve. Approximately 80% of the 90-year-old concrete Queensland Low-Water Crossing (115 to 120 feet in length) on the Wailua River North Fork was washed away.

The proposed project involves the repair of the Queensland Low-Water Crossing. The proposed design includes removing the remaining portions of the damaged crossing and replacing it with a new low-water crossing consisting of reinforced concrete boxes (RCB) spanning the stream and structurally tied together through a reinforced concrete slab poured on top of the RCBs. The RCBs will be anchored into a competent substrate to mitigate washout/sliding of the low-water crossing when high-velocity flows and/or large debris movement occurs. It is not anticipated that construction excavation will exceed 4 feet in depth. The crossing will include five-foot-wide concrete aprons upstream and downstream with a debris catcher on the upstream apron. The crossing will also include wingwalls along both banks upstream and downstream to prevent future scour of the crossing and roadway.

The project will also include construction of a new retaining wall immediately south of the Crossing, extending 108 feet along the access road's west side to manage flood water from an upstream breach of the river that occurred in 2018. During high stream levels, water breached the channel and flowed through this area, further damaging the crossing and the roadway. The retaining wall is located outside of the OHWM and is intended to protect the access road from further damage during future flood events. The project also includes improvements to the access road on both the north and south side of the stream, and placement of grouted riprap along the roadsides and around the west side of the retaining wall. A small section of the grouted riprap along the south side road extends into the stream on the downstream side to protect the low-water crossing wingwall, amounting to approximately 70 square feet, or 12 linear feet along the bank.

The project construction plans are provided in Attachment 3. Please note that Attachment 1 contains additional information and documentation for several items required in the SCAP application.

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

Please see Attachment 1, Item 31.

32. Identify and describe the project components outlined below

A. Materials

Materials used for the low-water crossing repair include concrete, stainless steel reinforcing bars, structural steel, anchor bolts, plates, gravel, aggregate base course, geotextile fabric, and gravel fill. Precast reinforced box culverts will be utilized for construction of the crossing. Asphalt concrete (A.C. State Mix IV) will be used for the access road improvements, and grouted riprap will be used along the road and along the south downstream side of the crossing to protect the structure.

B. Quantities

(17) 3' high x 4' wide x 15' long precast reinforced concrete box culverts
(1) continuous 5" thick x 85' long cast-in-place concrete slab

Estimated earthwork quantities:

Raw Cut = 159 CY

Raw Fill = 182 CY

C. Excavation

Excavation and grading will be conducted for placement of the precast box culverts and concrete aprons in the stream, as well as construction of the road improvement sections and retaining wall. The concrete aprons will require 3-foot depth excavation on both the upstream and downstream sides of the crossing. The road improvements sections on either side of the crossing will tie into existing grade of the gravel road.

D. Fill

A 6" layer of leveling gravel, 17 precast 3' x 4' x 15' concrete box culverts, a 5" thick x 85' long cast-in-place concrete slab, two concrete aprons, a debris catcher, and four wingwalls will be placed within the streambed and banks and remain as permanent structures for the crossing. A temporary sandbag diversion, 4' high will be placed in the stream and used during construction in two phases. The sandbag diversion will be removed once in-stream work is complete.

E. Disposal

Disposal of materials will include demolished portions of the remaining damaged crossing but is otherwise anticipated to be minimal. The contractor will be responsible for proper disposal of any construction waste at a County-approved landfill facility.

F. Construction methods

Construction of the low-water crossing repair project will likely follow the following steps:

1. Install the full-length silt curtain, sandbag stream diversion, sandbag berm, and other BMPs for Phase 1 of construction (north side crossing).
2. Demolish north side portion of remaining damaged low-water crossing.
3. Install and anchor precast box culverts within Phase 1 work area.
4. Pour 5" concrete slab over box culverts.

See Attachment 1, Item 32.F. for continued construction methods.

G. Temporary facilities

The temporary sandbag stream diversion and all other temporary BMPs required for staging and storage will be removed at completion of the project.

H. Expected period of time required for construction

Construction of the low-water crossing repair is expected to commence after all necessary regulatory permits and approvals have been secured. Completion of the construction is estimated at 12 months after the start of construction.

I. Liability during construction

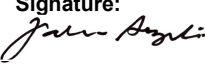


The contractor will be responsible for the job site safety and environmental protection throughout the course of the construction project. This requirement shall apply continuously and shall not be limited to only normal working hours. Strong construction best management practices, environmental protections, and construction monitoring will be required by the project specifications and permit conditions.

33. Describe the project's consistency with county zoning and development plans.

The project involves repair of an existing structure and does not require county zoning modifications or approvals. The project is not a development; therefore, consistency with county development plans is not applicable. The project restores access to a recreational facility valued by County residents.

34. Identify potential alternatives to the project and describe the relative costs and benefits of each alternative.

The crossing is critical infrastructure for access to this area of the Līhu'e-Koloa Forest Reserve and will provide a benefit to the community. Alternatives considered in a preliminary assessment of the damaged crossing include replacing the low-water crossing or constructing a bridge. The bridge was deemed too expensive and out of keeping with the nature of the Reserve.

SUBMITTALS		
<i>Please submit the following plans, maps, or drawings in legible form, preferably on 8.5" by 11" sheets.</i>		
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		
<p>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:</p> <ol style="list-style-type: none"> 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: Valerie Suzuki, DLNR Engineering	Signature: 	Date: May 25, 2023
38. CONSULTANT		
Print Name: Janice Marsters, Haley & Aldrich	Signature: 	Date: May 26, 2023
39. CONTRACTOR		
Print Name: TBD	Signature:	Date:
40. LANDOWNER (If multiple landowners, skip Section 53, then complete and attach Form SCAP-LND with appropriate landowner signatures.)		
Print Name: David Smith, DLNR DOFAW Administrator	Signature: 	Date: May 26, 2023

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. **Exempt - Government Agency**
- 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.

SCAP ATTACHMENTS:

ATTACHMENT 1: SCAP ADDITIONAL INFORMATION

ATTACHMENT 2: HICRIS PROJECT NUMBER 2023PR000658 REVIEW
DOCUMENTATION AND ARCHAEOLOGICAL LITERATURE REVIEW
AND FIELD INSPECTION

ATTACHMENT 3: SECTION 404 PRE-CONSTRUCTION NOTICE
APPLICATION FORM; SUBMITTED 05/10/2023 – IN REVIEW

ATTACHMENT 4: HEPA EXEMPTION

ATTACHMENT 5: QUEENSLAND 100% CONSTRUCTION DRAWINGS

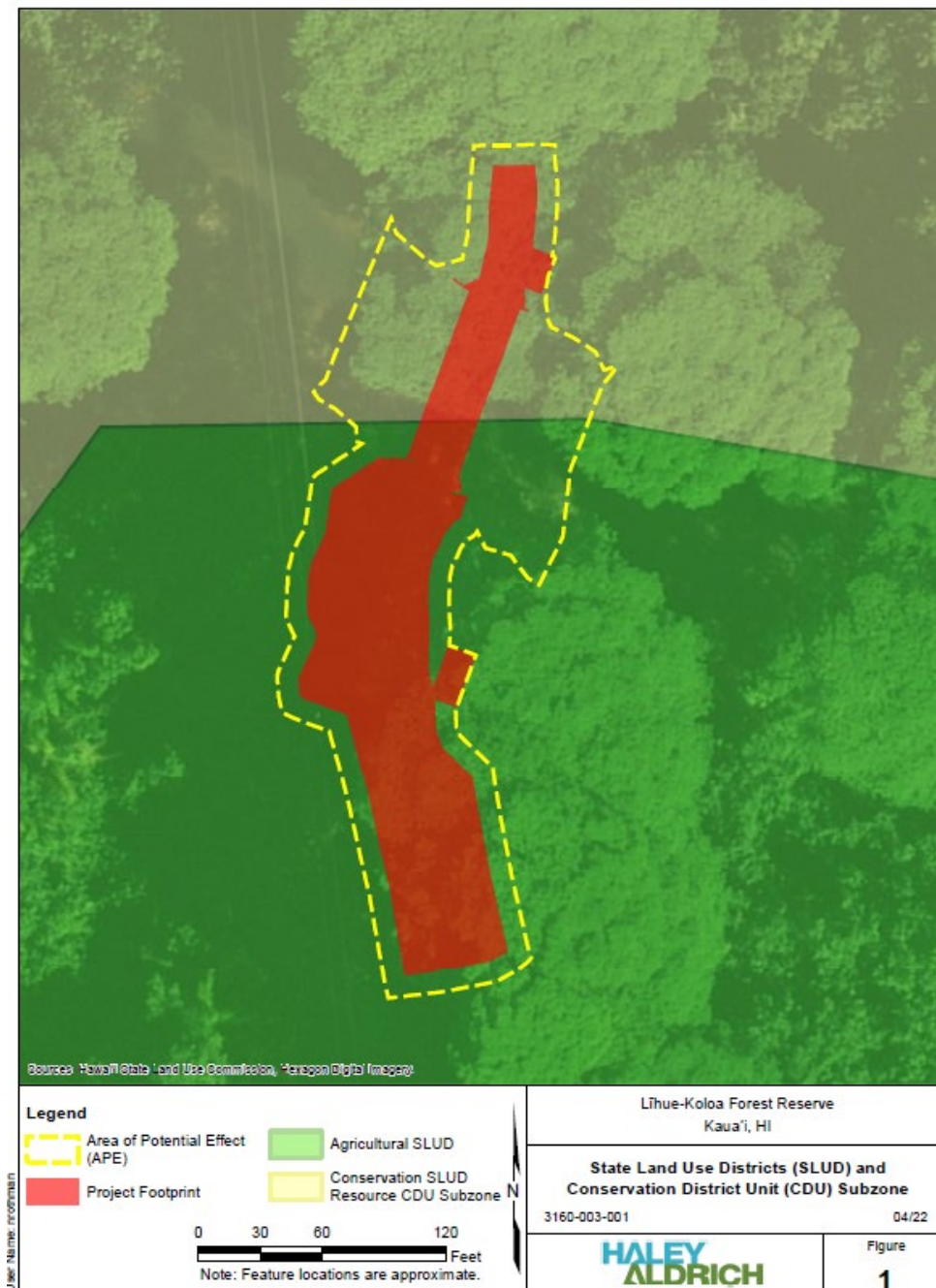
ATTACHMENT 6: USGS 7.5-MINUTE SERIES 2017 QUAD MAP -
WAI'ALE'ALE

ATTACHMENT 7: CONSERVATION DISTRICT USE REQUEST LETTER
FROM DLNR ENGINEERING TO DLNR OCCL, PROJECT NO.
D00AK67B

Stream Channel Alteration Permit Attachment 1 - Additional Information

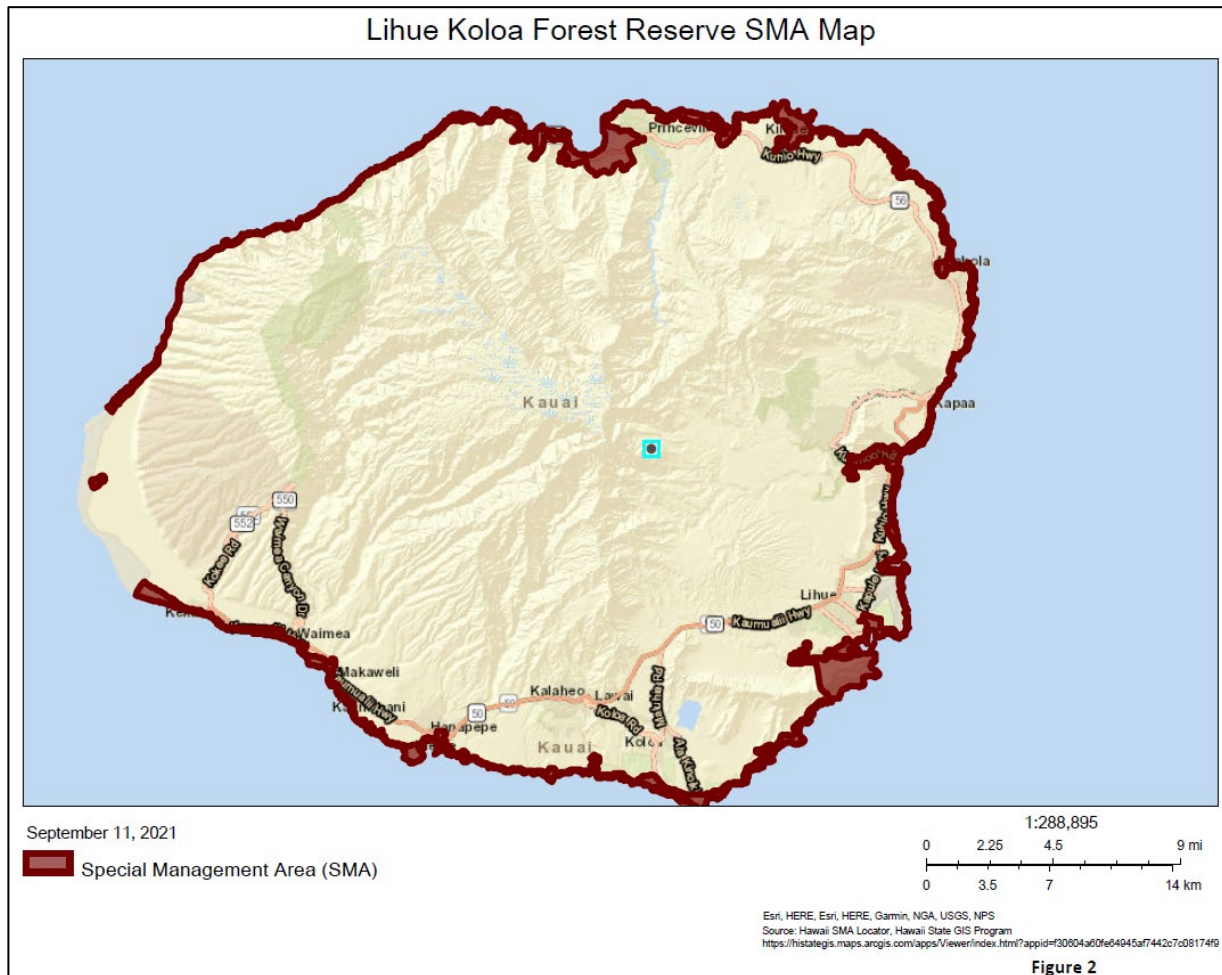
Item 15. Conservation Use District Permit (CDUP)

Approximately one-third of the project footprint is located within the Conservation Use District, Subzone Resource (Figure 1). The Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR DOFAW) possesses a blanket CDUP for work within their Reserves and will process the CDUP application for this project internally.



Item 16. Special Management Area Permit (SMAP)

The project is not located within a Special Management Area (Figure 2). No SMAP is required.



Item 17. State Historic Preservation Division (SHPD), Department of Land and Natural Resources

The project’s LRFI report (Attachment 2) has been submitted to SHPD in compliance with the State’s 6E requirements. SHPD has not yet provided a response.

Item 19. Other Regulatory Requirements – U.S. Army Corps of Engineers

The Līhu‘e-Koloa Queensland Low-Water Crossing project applicant has submitted a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers as required under Section 404 of the Clean Water Act (Attachment 3). Verification of coverage under Nationwide Permit (NWP) #3 is anticipated.

Item 20. Other Regulatory Requirements – State Department of Health, Clean Water Branch

The Līhu‘e-Koloa Queensland Low-Water Crossing project will conform with the applicable provisions of the water quality and water pollution control standards contained in HAR, Title 11, Chapters 54 and 55.

If it receives NWP #3 verification, the project will qualify for Hawaii's Blanket 401 permit with the Army Corps.

Item 22. Hawaii Environmental Policy Act

DLNR believes the project qualifies for an Exemption under as defined by HRS §343-5(b)(2) and HAR §11-200.1-15. HEPA documentation is contained in Attachment 4.

Item 31. Existing stream channel and streamflow conditions at the site

Lihue-Koloa Queensland low-water crossing is located on the North Fork of Wailua River, which flows east from the eastern slopes of Mount Wai'ale'ale for seven miles before reaching the Queensland crossing. The North Fork continues east approximately six miles before joining the South Fork Wailua River, forming Wailua River, which continues another two miles to reach the Pacific Ocean. The drainage area at the crossing location is 6.82 square miles (4365 acres)¹. A summary of the estimated discharges for the 10-, 25-, 50-, 100-, and 500-year recurrence intervals at the crossing location is shown below.

Table 1. Weighted estimate of discharge (cubic feet per second) from regression analysis

Site	10-year	25-year	50-year	100-year	500-year
Queensland Low-Water Crossing	8,380	10,890	12,900	15,060	20,400

The width of the North Fork Wailua River is approximately 100 feet at the crossing location and comes out of a sharp bend approximately 250 linear feet upstream. During the April 2018 flood event, the river breached its banks at the bend, damaging the adjacent access road at the south side of the crossing.

Item 32.F. Construction Methods (continued from form)

The construction contractor will likely follow the construction methods listed below:

5. Install upstream and downstream concrete aprons and upstream debris catcher within Phase 1 side.
6. Install north bank wingwalls (Phase 1).
7. Remove in-stream Phase 1 BMPs and install full-length silt curtain, sandbag stream diversion, silt fence, and other BMPs for Phase 2 of construction (south side crossing).
8. Repeat sequence of construction, Steps 3 through 7 for Phase 2. Remove in-stream BMPs. Maintain land-based BMPs.
9. Construct retaining wall along existing access road (south side).
10. Grade and construct new road improvements south side and tie into existing grade gravel road.
11. Install grouted riprap along south side access road and around retaining wall.
12. Grade and construct new road improvements north side and tie into existing grade gravel road.
13. Install grouted riprap along north side access road.
14. Stabilize site and remove BMPs.

¹West Consultants, Inc. (2019). Lihue-Koloa Forest Reserve Road Damage Hydrologic Study. Memorandum to Hart Crowser, Inc.

4 | Lihue-Koloa Forest Reserve Queensland Low-Water Crossing

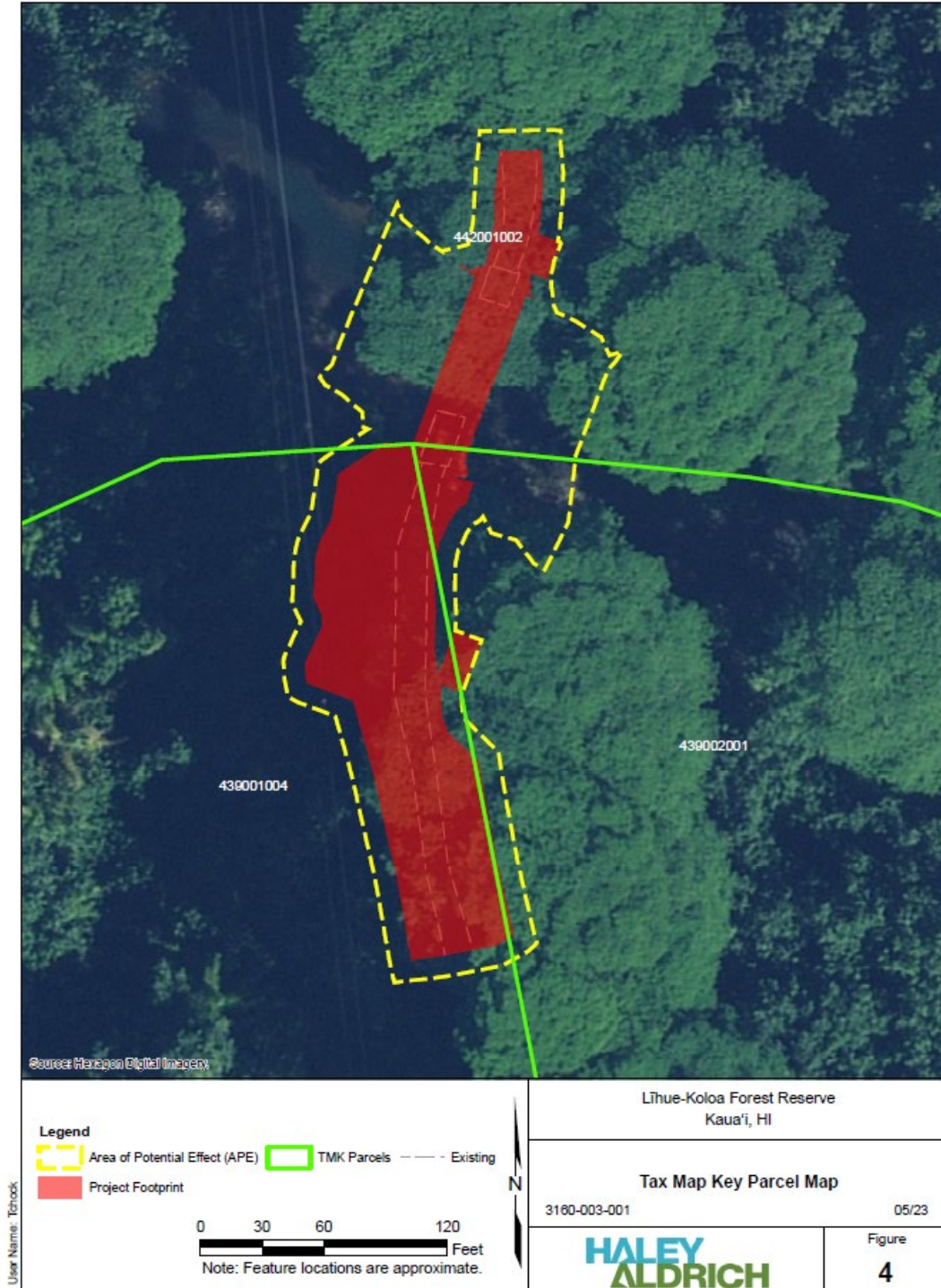
Item 35. Location Map



Item 36. Plans/Elevations/Sections

Please refer to Attachment 5 for the project engineering design drawings.

Figure 4 – Tax Map Key Map



From: [HICRIS](#)
To: [Chock, Taylor](#)
Subject: HICRIS Project Review Initial Submission Accepted by SHPD as Project Number 2023PR00658
Date: Wednesday, May 24, 2023 10:03:53 AM

CAUTION: External Email

This is an automated notification sent by the Hawaii State Historic Preservation Division (SHPD) from the Hawaii Cultural Information System (HICRIS).

Your submission 2023PR00658.001 has been accepted and a new Project has been created named Līhu'e-Kōloa Forest Reserve Queensland Low Water Crossing Project. Please refer to **Project Number 2023PR00658** in all future correspondence related to this project. You will receive further notifications from HICRIS when SHPD has completed their review of your submission, which may require further action on your part at that time.

To check the status of your projects, please look under the My Requests and SHPD Responses links on the HICRIS Home page. If you don't find any Responses to your project in the SHPD Responses section of HICRIS or any Requests in the My Requests section of HICRIS then there are no updates for your project currently. If you need technical support with HICRIS, please email dlnr.hp.hicris@hawaii.gov.

<https://shpd.hawaii.gov/hicris/>

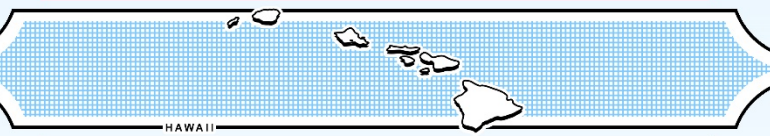
**AN ARCHAEOLOGICAL LITERATURE REVIEW
AND FIELD INSPECTION FOR THE LĪHU‘E-KŌLOA
FOREST RESERVE ROADWAY CROSSINGS PROJECT
WAILUA AHUPUA‘A, KAWAIHAU DISTRICT (PUNA MOKU),
ISLAND OF KAUA‘I [TMK: (2) 3-2-001:002]**

Prepared by
Chong Jin B.A.
and
Michael Dega, Ph.D.

January 2023
DRAFT

Prepared for
Hart Crowser
500 Ala Moana Blvd #6-250
Honolulu, HI 96813

SCIENTIFIC CONSULTANT SERVICES, Inc.



1357 Kapiolani Blvd., Suite 850 Honolulu, Hawai‘i 96814

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INTRODUCTION

At the request of engineering consulting company Hart Crowser, Scientific Consultant Services, Inc. (SCS) has prepared this Archaeological Literature Review and Field Inspection (LRFI) for the Līhu‘e-Kōloa Forest Reserve Roadway Crossings Project in Wailuā Ahupua‘a, Kawaihau District, Island of Kaua‘i [Tax Map Key (TMK) parcel (4) 4-2-001:002].

SCS conducted field inspection of three damaged water crossings within the Līhu‘e-Kōloa forest reserve known as Keāhua Stream Ford, New Crossing, and Queensland Crossing. The damage was caused by extreme flooding during a storm in 2018 and by additional flooding in 2020. The inspection only included the Areas of Potential Effects at and in the vicinity of the water crossings at Keāhua Stream, Uhau‘iole Stream, and Wailuā River (North Fork) for Keāhua Stream Ford, New Crossing, and Queensland Crossing, respectively.

This report is not intended to meet HAR §13-276 requirements for an archaeological inventory survey, but to identify potential cultural resources in the area of potential effects and its vicinity, as well as to provide in brief the history of archaeological research nearby. Thus, the scope of work for the current investigation includes the following two aspects:

- Literature review consisting of a study of previous archaeological reports pertaining to the area of potential effects and its vicinity. This research is conducted in order to determine what type of archaeological sites have been recorded in the area of potential effects environs, broadly construed, and what features or sites are likely to be documented on the subject property or the terrain adjacent to it, if any.
- Field inspection via pedestrian survey of the area of potential effects. This inspection is conducted in order (1) to identify any surface archaeological features and (2) to investigate and assess the potential for impact to such sites. This assessment will also identify any sensitive areas that may require further investigation or mitigation before work on the project proceeds.

SCS archeologist Trevor Iliff, B.A., conducted the field inspection under the direction of principal investigator Michael Dega, Ph.D., on June 29, 2021. No newly identified historic properties were recorded within the area of potential effects during the pedestrian survey, although a few previously documented sites were found and redocumented.

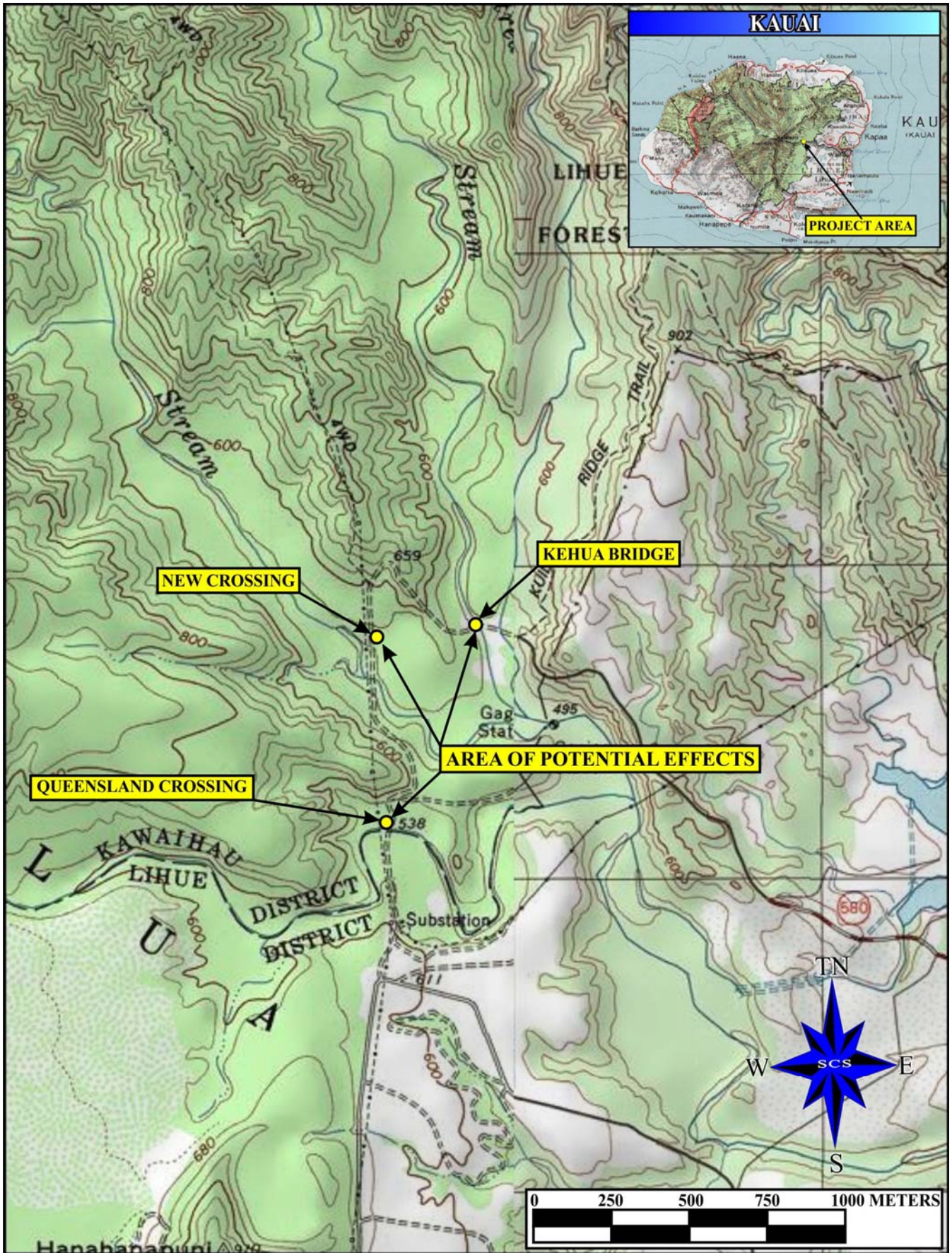


Figure 1: Composite USGS topographic map (Waialeale HI 1983 and Kapaa HI 1996 quadrangles) showing the location of the area of potential effects

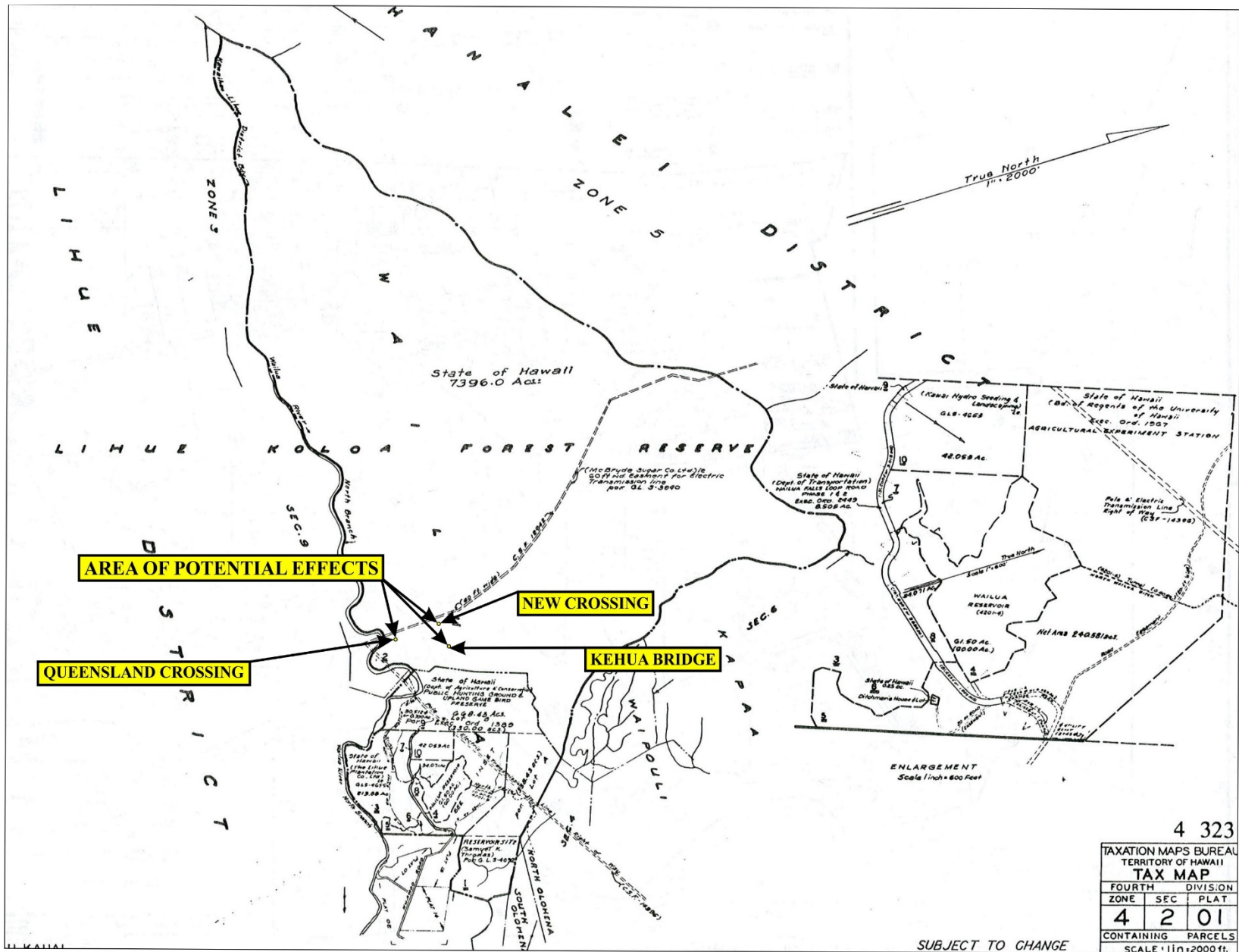


Figure 2: A portion of a TMK map showing the location of the area of potential effects in TMK: (4) 4-2-001:002 (County of Kaua'i 2020)



Figure 3: A 2013 Google Earth aerial photograph showing the location of the area of potential effects

ENVIRONMENTAL SETTING

LOCATION

The areas of potential effects consist of three small zones around three water crossings within TMK: (4) 4-2-001:002, a parcel which comprises the majority of the lands within Līhu‘e–Kōloa Forest Reserve. The elevation of the area of potential effects is approximately 500–600 ft (152–163 m) above mean sea level, putting it well above the residential zones *makai* (seaward) of Wailuā Reservoir to the southeast.

The area of potential effects falls within Wailuā Ahupua‘a, located in the district of Kawaihau (Hawaii Statewide GIS Program 2020). Kawaihau is one of the five judicial districts dividing the County of Kaua‘i and comprising the northeastern portion of the island.

GEOLOGY

Kaua‘i is the oldest of the major Hawaiian Islands. At its highest point it rises to a height of 1,598 meters and stretches for about 52 kilometers (32 miles) in length and 40 km (25 miles) in width. Geologists estimate submarine volcanic eruptions leading to the island’s formation to have occurred between 2 to 4 million years ago (Stearns 1966:190). A volcanic fissure on the ocean floor where Kaua‘i now exists developed into a southeasterly chain of activity that has most recently formed the youngest island, Hawai‘i. During the late Pliocene Era approximately 1.4 million years ago, eruptions from the volcanic vents in Kōloa began to modify the landscape of Kaua‘i, covering canyon walls and displacing streams. Surface lava flows from Kōloa encompassed over half of the eastern portion of the island, including the project parcel. These Kōloa flows occurred on top of the older Waimea lava flows (Stearns 1966:190).

CLIMATE

The area of potential effects is located in the central-eastern side of Kaua‘i, on the windward side of the island. As it faces the prevailing northeastern trade winds which bring clouds and precipitation, and because rainfall is greater in the mountains, the area of potential effects should receive relatively high rainfall. Mean annual rainfall over the area of potential effects is 2546 mm (100 in) (Giambelluca et al. 2014). Rainfall remains high throughout the year, peaking at 282 mm (11 in) in November, with a nadir of 174 mm (6.9 in) in February (Giambelluca et al. 2014).

Average annual air temperature in the area of potential effects is 21.8 °C (71.2 °F). August is the hottest month with an average of 23 °C (74 °F), while February is the coolest with an average at 20 °C (68 °F) (Giambelluca et al. 2014).

SOILS

According to Foote et al. (1972: Sheet 20) and the National Cooperative Soil Survey (Figure 4), two segments of the area of potential effects (New Crossing and Queensland Crossing) fall within a curving region along the streams where the topsoil is Kolokolo clay loam, 0 to 2 percent slopes (Kw). The third crossing (Keāhua Stream Ford) falls within a small region of Marsh (MZ).

The Kolokolo series “consists of well-drained soils on the bottom lands” of Kaua‘i and are “developed in alluvium washed from upland soils” (Foote et al. 1972:73). Kw has slight runoff and erosion risk but “is subject to damaging overflow” (Foote et al. 1972:73). It is typically used for pasture.

According to the soil survey conducted by Foote et al., MZ “consists of wet, periodically flooded areas covered dominantly with grasses and bulrushes or other herbaceous plants. It [typically] occurs as small low-lying areas along the costal plains” (Foote et al. 1972:95).

Table 1: Soil types on the soil map (Figure 4, below)

Map	Full Soil Name	Map	Full Soil Name
HfB	Halii gravelly silty clay, 3 to 8 percent slopes	KkE	Kapaa silty clay, 25 to 40 percent slopes
HfC	Halii gravelly silty clay, 8 to 15 percent slopes	KUL	Kolokolo extremely stony clay loam
HfD2	Halii gravelly silty clay, 15 to 25 percent slopes, eroded	Kw	Kolokolo clay loam
HfE2	Halii gravelly silty clay, 25 to 40 percent slopes, eroded	MZ	Marsh
HnA	Hanalei silty clay, 0 to 2 percent slopes,	PIB	Pooku silty clay loam, 3 to 8 percent slopes
HpA	Hanalei peaty silty clay loam, 0 to 2 percent slopes	PID	Pooku silty clay loam, 8 to 25 percent slopes
HsB	Hanamaulu silty clay, 3 to 8 percent slopes	PmD	Pooku silty clay, 15 to 25 percent slopes
HsC	Hanamaulu silty clay, 8 to 15 percent slopes	PmE	Pooku silty clay, 25 to 40 percent slopes
KkC	Kapaa silty clay, 8 to 15 percent slopes	rRR	Rough broken land
KkD	Kapaa silty clay, 15 to 25 percent slopes	rRT	Rough mountainous land

VEGETATION

According to Juvik and Juvik (1998:122, 127–128) before human settlement the native ecosystem of the region would have been “wet forest and woodland.” Persisting indigenous flora includes ‘ākala (*Rubus hawaiiensis*), hala (*Pandanus tectorius*), koa (*Acacia koa*), ‘ohi‘a (*Metrosideros macropus*), ‘ōlapa (*Cheirodendron* spp.), and uluhe (*Dicranopteris linearis*).



Figure 4: Google Earth aerial photograph showing the soil series in the area of potential effects and in its vicinity (U. S. Department of Agriculture Natural Resource Conservation Service, and University of California at Davis Soil Resource Lab 2017)

HYDROLOGY

The state Division of Aquatic Resources (Parham et al. 2008) places the area of potential effects within the Wailuā River watershed. Wailuā River is a perennial stream with numerous tributaries, including the Keāhua and Uhau‘iole Streams.

HISTORICAL SETTING

Archaeological data indicate that the initial settlement of the Hawaiian Islands by Polynesians occurred on the windward shores around the 10th century, with populations extending into leeward areas in later periods (Kirch 2011:22). It is likely that settled human presence in the area of potential effects can be traced to the early period of agricultural development, which on Kaua‘i began approximately 1100–1300 (Kirch 1985:100–01).

PRE-CONTACT

Pre-Contact Hawaiian economy was based on agricultural production, marine exploitation, and raising livestock, in addition to collecting wild plants and birds. Patrick Kirch notes that the Pre-Contact Hawaiian economy was productive and diverse enough to support “considerable craft specialization ... canoe-makers, adz-makers, bird-catchers, wood-carvers and tattooing experts” (1985:3). The existence of these specialized artisans and artists implied a sophisticated society with both surplus food and spare labor.

Settlements were often concentrated in river valleys most amenable to wet *kalo* (taro, *Colocasia esculenta*) cultivation, which incorporated *lo‘i* (pond fields) and irrigation canals. Areas with higher precipitation permitted cultivation of *kō* (sugar cane, *Saccharum officinarum*) and *mai‘a* (banana, *Musa* spp.). Dryland agriculture flourished on *kula* (plain, field) or areas with *‘uala* (sweet potato, *Ipomoea batatas*) as the staple crop, especially on the leeward sides of the islands. These two patterns of wetland and dryland agriculture were typical of all islands in the Pre-Contact period (Kirch and Sahlins Vol. 1, 1992:5, 119).

Each *mokupuni*. (island) was divided into *moku* (districts) which were in turn divided into *ahupua‘a*. These land divisions usually extended from the ocean to the mountain peaks in order to incorporate the natural resources relevant to subsistence and provide access to the ecosystems at all elevations (Lyons 1875:111). Their name is likely derived from the practice of marking their boundaries by a heap (*ahu*) of stones surmounted by an image of a pig (*pua‘a*), or because a pig or other tribute was laid on the altar as tax to the chief (Native Hawaiian Library n.d.). Some of these ancient divisions are still in common use to locate and refer to geographical features not only on Kaua‘i, but also on the rest of the islands (Sterling 1998:3).

Land was considered under the stewardship of the *ali'i 'ai moku* (king), and his role was to ensure rights and responsibilities rather than ownership. The king kept the parcels he wanted, and distributed large parcels to his higher chiefs, who in turn, distributed smaller parcels to lesser chiefs. The *maka 'āinana* (commoners; *lit.* people that attended the land) worked individual plots of land. According to Paul Lucas (1995:40) the *'ili* were smaller land divisions administered by the *ali'i* (chief) who controlled the corresponding *ahupua'a*. The land holding of a *hoa 'āina* (tenant) was called a *kuleana* (right, privilege), a term that also came to mean “property” or “title” (Lucas 1995:61).

Wailuā River is the largest river in the Hawaiian archipelago and is navigable by large canoes for some distance upstream. Its valley cuts between two mountains just before the river enters the sea. The abundance of freshwater and fertile land along the North and South forks of Wailuā River and 'Ōpaeka'a Stream make the *ahupua'a* of Wailuā an attractive location for settlement. The upland areas of Wailuā were likely also productive zones for procuring natural resources: wood, feather products, medicines, and kapa cloth made from the *wauke* plant (paper mulberry, *Broussonetia papyrifera*). The *ahupua'a* became a political and religious center, one of two on the island, supported by extensive irrigated *kalo* fields, the fishponds constructed behind the dunes (e.g., Loko Pu'uone), *'uala* growing along the coastal plain, and the marine resources of Wailuā Bay. Francis Ching (1968) identified seven *heiau* (temples of the Hawaiian religion) in Wailuā Ahupua'a, testifying to its economic and cultural importance.

During the Pre-Contact Period, the lower portion of Wailuā Ahupua'a, where the river meets the ocean, was called Wailuā Nui Hoano (Great Sacred Wailuā). It was also one of the most sacred areas and was *kapu* (taboo, forbidden) to commoners. Edward Joesting writes that “a short way up the path of the chiefs is a place of immense importance to all Kauai royalty. Beneath a cliff are the Birthstones, two large pieces of smooth stone” (Joesting 1987:8). All Kaua'i *ali'i* were to be born at the sacred birthing stones. During periods “when the chiefly class became diminished for some reason, the King selected women of common birth to deliver children at the Birthstones. Legend says such a child would be a chief” (Joesting 1987:9). The important role the Birthstones of Holoholukū played during Pre-Contact times is shown in an ancient chant quoted in part by Joesting:

The child of a chief born at Holoholo-ku is a high chief;
The child of a commoner born at Holuholu-ku becomes a chief also;
The child of a high chief born outside of Holoholo-ku is no chief, a
commoner he! [Joesting 1987:9]

According to oral tradition there was a *pu'uhonua* (place of refuge) in Wailuā Ahupua'a, where people could flee to be saved from death. The extent of this refuge is not clear. Some suggest that the *pu'uhonua* was known as Hauola and consisted of the area around Hikina'akala Heiau near the mouth of Wailuā River (Bennett 1931:125; Dickey 1917:15–16). Others have suggested that the entire *ahupua'a* of Wailuā was a *pu'uhonua* (Kamakau 1976:17; Flores 1995: IV-10-11). The existence of this *pu'uhonua* also demonstrates the cultural and political importance of Wailuā and its reputation as a sacred place.

EARLY POST-CONTACT

The Post-Contact Period began in 1778 when Kaua'i was the first Hawaiian Island to encounter British Explorer Captain James Cook (Daws 1968:1). While early contact on Kaua'i took place on the western side of the island at Waimea, on the opposite side from the Wailuā, later arrivals visited greater parts of the island. Soon after, missionaries, visitors, and entrepreneurs also began arriving. Much of the knowledge of traditional land use and other practices in Hawai'i is based on what was recorded at the time of, and shortly after, Western Contact. Captain George Vancouver (1978:221–222) recorded the following observations of Wailuā during his visit:

This part seemed to be very well watered, as three other rapid small streams were observed to flow into the sea within the limits above mentioned. This portion Attouai [Kaua'i], the most fertile and pleasant district of the island, is the principal residence of the King, or, in his absence, of the superior chief, who generally takes up his abode in an extensive village, about a league to the southward of the north-east point of the island. [Vancouver 1978:221–222]

Contact with the West came at a time of escalating war and political consolidation in the Hawaiian Islands. The great chiefs on the islands of Maui and Hawai'i were vying for dominance in a struggle that had been ongoing for generations. Warfare intensified as the capabilities of their consolidated chiefdoms reached the point where they could aim for the prize of unification of the entire island chain. Contact offered the chance for ambitious chiefs to procure gunpowder weapons that could turn the tide of battle, and Hawai'i chief Kamehameha I (r. 1782–1819) proved the most successful at amassing and employing the new weapons, conquering Maui and O'ahu and consolidating control of Hawai'i. While Kaua'i, which was distant from the main theater of conflict, had its own civil war during this time, the relative remoteness made invasion a difficult prospect. Nonetheless, when Kaua'i chief Kaumuali'i saw that his relatives ruling Maui and O'ahu were defeated, he knew that Kamehameha would inevitably seek to take Kaua'i as well. Kaumuali'i scrambled to acquire ships, guns and promises of protection from any westerners who came by to trade.

Ultimately, Kaua‘i was saved from invasion not by the defenses that Kaumuali‘i amassed, nor by the intervention of the western powers he courted, but by a storm in 1796 that disrupted Kamehameha’s invasion fleet and a plague in 1804 that ravaged his army (Joesting 1984:55-63). Instead, Kamehameha completed the unification of the islands by negotiation when Kaumuali‘i agreed to become his subordinate in 1810 (Joesting 1984:66-68).

Kamehameha I had won his wars with the aid of gunpower weapons gained by trade with passing American and European ships, and he shrewdly maintained control of foreign trade, which he made a royal monopoly (Daws 1968:44). Kamehameha’s successors gave into the pressure from the lesser chiefs, who wanted a share of the bounty, especially exotic merchandise brought in by foreign merchants. During the reign of Liholiho (Kamehameha II, r. 1819–1824), chiefs imported foreign goods on credit, promising payment in sandalwood cut from the mountains. This practice caused famine because workers levied for the task were taken away from subsistence agriculture. In addition, the supply of sandalwood trees was exhausted within a few decades (Rhodes and Greene 1993: Chapter IV). By the reign of Kamehameha III (Kamehameha III, r. 1825–1854), free enterprise dominated commerce in the islands, and suppling the booming whaling industry had become the main non-subsistence economic activity.

THE MĀHELE

In the 1840s, during the reign of Kamehameha III, consequential changes in land tenure occurred. The change is commonly referred to as the “*Māhele*” (division). Prior to the changes, a *konoiki* was a superintendent of an *ahupua‘a* under a chief and was responsible for the management of resources. After the *Māhele*, the *konoiki* (*ahupua‘a* headmen) and his or her lands were distributed, and the position was replaced by a land commissioner, or *komikina ho‘on‘āina* (Lucas 1995:56).

Introducing Western-style land ownership had long been advocated by foreign advisors to the *mō‘ī* (king) and his *ali‘i*. The five-month occupation of the islands by British naval officer George Paulet in 1843 showed that Hawaiian sovereignty was precarious, and those advisors “pointed out to Kamehameha III that by granting others the right to own land, he would give himself the same privilege... to assign lands to his personal ownership” (Moffat and Fitzpatrick 1995:50), theoretically allowing him to retain land as private property even if national sovereignty were lost. Jon Chinen (1958:25) also notes that the *mō‘ī* “did not want his lands to be considered public domain and subject to confiscation by a foreign power in the event of a conquest.”

Chinen (1958:8) reports that the Board of Commissioners to Quiet Land Titles (often shortened to “the Land Commission”) was established in 1845 for “the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any land property.” The parcels awarded by the Land Commission were called Land Commission Awards (LCAs). Initially, this only established crown lands owned by the king, *aupuni* lands, and private lands owned by the *ali‘i* (also known as “*konohiki* lands,” named after the term for an *ahupua‘a* headman). Chinen (1958:10) explains that “except for the government’s right of commutation, a Land Commission Award gave complete title to the lands confirmed. The commutation was satisfied by the payment of cash or the return of land of equal value... generally one third of the value of the unimproved land as of the date of the award.”

The Kuleana Act of 1850 allowed *maka‘āinana* to file claims for land parcels and house lots on which they had been living or cultivating. In order to file claims, however, the *maka‘āinana* first had to be aware of the awarding of *kuleana* lands and LCAs, procedures that were largely foreign to them. In some cases, the *ali‘i* or *konohiki* may have discouraged their *hoa‘āina* from filing claims, and many of the *maka‘āinana* could not afford the costs associated with filing. People claiming house lots in Honolulu, Hilo, and Lāhainā were in addition required to pay commutation to the government before obtaining a Royal Patent (RP) on their awards (Chinen 1961:16). Rural *kuleana* claims required a survey, which could be quite costly, assuming the services of one of the few surveyors in the islands could be obtained (Moffat and Fitzpatrick 1995:50). Surveys (and thus, awards) of rural *kuleana* lands often only encompassed land under active cultivation, without including locations such as fallow lands, stream fisheries, *‘okipu‘u* (swidden gardens), and others (Kame‘eleihiwa 1992:295; Kirch and Sahlins 1992:23, 110). These factors may have contributed to the relatively low number and size of claims, as only 8421 *kuleana* awards were issued, totaling only 28,658 acres (Moffat and Fitzpatrick 1995:50).

Kamanamaikalani Beamer and N. Wahine‘aipohaku Tong (2016:130) argue that the *kanaka maoli* (indigenous people) were able to acquire land for themselves, pointing out that although the claims system appears to have awarded the *maka‘āinana* little, records show that they were able to purchase an estimated 167,290 acres of land between 1850 and 1893, often *aupuni* lands sold to them at relatively low cost. Beamer and Tong (2016:136) also argue that many *ali‘i* leased or sold land to *hui* (associations) of *kanaka maoli*, in keeping with the former *ali‘i - hoa‘āina* relationship. In these ways, lands not awarded to *maka‘āinana* during the Māhele were still made available to them.

With land ownership established in law, foreigners gained the long-demanded right to own land in the Kingdom of Hawaii through the Alien Land Ownership Act of 1850, and would eventually acquire “almost two-thirds of the total land area” (Van Dyke 2009:51).

The Office of Hawaiian Affairs (2016) *Kipuka Online Database* includes a number of LCAs in Wailuā Ahupua‘a, all of which are in the lowlands within 2 km of the coast and clustered near the banks of Wailuā River. It also lists land grants, which were not awarded as part of the Māhele but instead were parcels sold by the Hawaiian government out of the *aupuni* lands in order to generate income. The extent of these parcels reaches further upland, but still stops short of Wailuā Reservoir. The area of potential effects, located in the forest, is distant from any grants or claims.

Unlike many *ahupua‘a*, which were claimed by a single *ali‘i* in their entirety aside from the *kuleana* lands, the only noble claim in Wailuā Ahupua‘a came from Iosia Kaumuali‘i. He was the son of Deborah Kapule, the wife of Kaumuali‘i, and was appointed as a *konohiki* of Wailuā by Ka‘ahumanu, the *kuhina nui* (prime minister) of the Kingdom of Hawai‘i. Aside from this claim, there were 28 *kuleana* claims for *pāhale* (houseslots), *ala nui* (access routes, trails), *lo‘i* (pond fields), and *kula* in Wailuā Ahupua‘a (Stauffer 1993).

MID 19TH CENTURY TO PRESENT

Whaling declined in the late 19th century, and sugar cane cultivation and ranching came to the forefront of Hawaiian economy, in part because the Māhele had allowed the consolidation of now privately owned lands into vast plantations and ranches. The Reciprocity Treaty of 1875 permitting duty-free trade of sugar between the Kingdom of Hawai‘i and the United States eventually turned Hawaiian sugar into an immensely profitable commodity that would make commercial agriculture the economic mainstay until well into the next century (Kuykendall 1967:46–48).

The first sugar plantation in Kaua‘i was founded in relatively humble circumstances. Koloa Plantation pre-dated the Māhele, and was initially run on leased lands. As the first major sugar operation, it suffered difficulties in cobbling together sugar production facilities under the direction of determined but inexperienced managers. Nonetheless, it was ultimately successful in producing commercial sugar products. Koloa Plantation set the model for those that would come after, including payment in company script (adopted because of the lack of available coinage) redeemable at a company store (Joesting 1984:130–35). The second sugar plantation on Kaua‘i, the Lihue Plantation Company was founded in 1849 and also pioneered new methods, such as building the first sugar irrigation ditch in the islands (Wilcox 1996:68-70). Kaua‘i would see over 30 sugarcane plantations, though only a handful would survive to the 20th century (Dorrance and Morgan 2000:25).

The sugar industry propelled the so called “Big Five” corporations, all of which started as sugar factors, into a dominant position in the economy, such that they eventually “took over bodily the wholesaling of goods coming into the Islands; ninety percent of retail stock came from their warehouses” (Young 2017:1). Even after agriculture eventually gave way to tourism as the primarily economic activity in the Hawaiian Islands, many of these companies continued to be major players in real estate, shipping, and other businesses.

PREVIOUS ARCHAEOLOGY

The earliest archaeological endeavors on Kaua‘i in general were undertaken by Thomas G. Thrum (1909), and Wendell C. Bennett (1931) with the sponsorship of the Bernice Pauahi Bishop Museum. These studies identified a number of *heiau* and other religious features. Most of the archaeological research in Wailuā Ahupua‘a, however, is more recent. The bulk of archaeological studies occur after the implementation of the State Historic Preservation Division’s (SHPD’s) requirements for protection of significant cultural, historical and archaeological properties in the 1980s. Almost all of these studies have been in the lowlands, usually along the coast, with little work in the forested uplands. The relatively sparse archaeological work in the vicinity of the area of potential effects is shown on Figure 5 and described below.

KEĀHUA ARBORETUM (KIKUCHI 1988, YENT 1988, SPEAR 1992)

In 1988, William Kikuchi (1988) of Kaua‘i Community College performed an archaeological field inspection of the Keāhua Arboretum [also in TMK: (4) 4-2-001:002]. An adze workshop, consisting of adze preforms and debitage, was identified and later designated as State Inventory of Historic Places (SIHP) Site Number 50-30-07-04000. Cultural materials were collected on the surface in an approximately three-acre area (Kikuchi 1988).

Subsequently, Martha Yent (1988) of the Department of State Parks conducted follow-up archaeological investigations of SIHP Site -04000, with an expanded area of potential effects of approximately 20 acres. This study mapped, surveyed and tested SIHP Site -04000, recording that the site occurred as discontinuous flakes scatters on the ground, with adze preforms occurring both within the scatters and as isolated finds. Test excavations showed that the cultural deposits were shallow, extending only 25 centimeters below surface. Yent (1988) concluded that the scatters and artifacts had been affected by previous bulldozing.

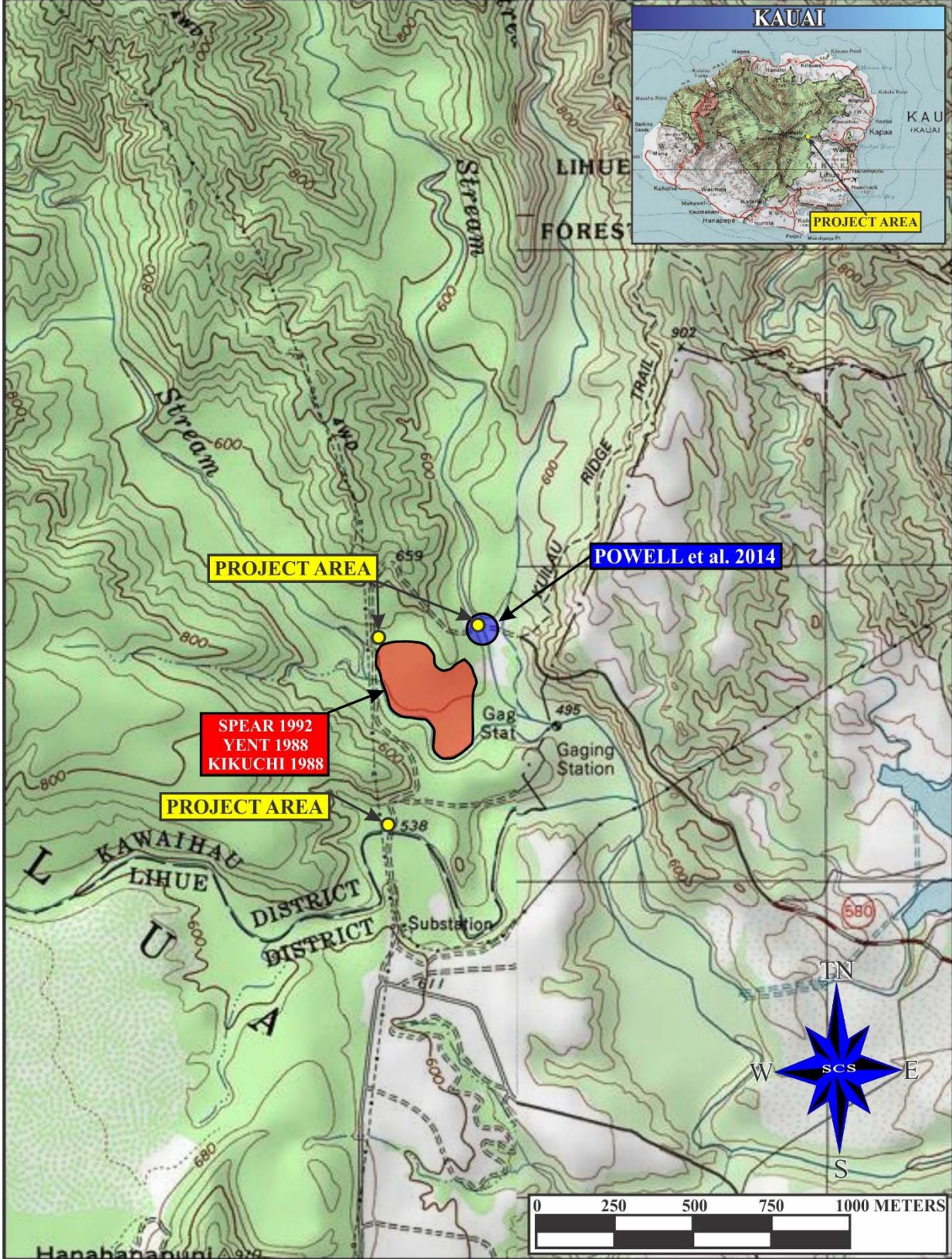


Figure 5: Composite USGS topographic map (Waialeale, HI 1983 and Kapaa, HI 1996 quadrangles) showing previous archaeology in the vicinity of the area of potential effects

In 1992, SCS (Spear 1992) conducted an archaeological survey of the same area to determine if SIHP Site -04000 extended into and beyond a Kaua‘i Electrical Division power line corridor. A total of 15 test units were excavated in and around the corridor, and cultural materials, including 15 pieces of basalt debitage and one split hammerstone, were recovered from four of these units. Robert Spear (1992) notes that both this study and the prior study by Yent (1988) also found tools not related to adze production, such as cobble cores, hammerstones, edge altered flakes and an awl. Therefore, while adze manufacturing may have been the primary use of the site, other activities likely also took place. The wide distribution of cultural materials suggests repeated visits over time. The lack of grinding or abrading stones and polished adzes or flakes suggests that the area was a workshop for adze blanks preforms, and the tools were finished elsewhere, probably after being transported to a coastal region (Spear 1992).

KEĀHUA STREAM BRIDGE (POWELL et al. 2014)

In 2014, SCS (Powell et al. 2014) conducted an archaeological inventory survey (AIS) of a one-acre area around Keāhua Stream Ford (overlapping with the current area of potential effects) for the Keāhua Stream Bridge Project. During a pedestrian survey, two historic properties were identified. Keāhua Stream Form was designated as SIHP Site No. 50-30-07-02248, and an adjacent basalt and concrete retaining wall along the stream was designated as SIHP Site No. 50-30-07-02249. Both sites were dated to 1964 based on dates inscribed on them. Three trenches were excavated, but no subterranean cultural deposits were found. No further work was recommended.

Subsequent to the completion of the AIS (Powell et al. 2014), the Keāhua Stream Bridge was constructed alongside the Keāhua Stream Ford (SIHP Site -02248), and over the retaining wall (SIHP Site -02249). Figures 6 and 7 are 2014 photographs of SIHP Sites -02248 and -02249 prior to the construction of the bridge, while Figure 8 is a 2019 photograph of the sites afterwards. Both sites were left in place and do not appear to have been impacted by the bridge construction; the damage to the ford (SIHP Site -02248) seen in Figure 8 is from flooding.

ARCHAEOLOGICAL FIELD METHODS

The archaeological field inspection was conducted for the project on June 29, 2021, by SCS archaeologist Trevor Iliff, B.A., under the supervision of principal investigator Michael F. Dega, Ph.D. Iliff was accompanied by wildlife biologist Maya LeGrande and Hart Crowser Assistant Project Manager Lisa Bledsoe during the inspection. Field methods included a pedestrian survey of the entire area of potential effects accompanied by digital photographs taken at multiple locations within and around it. Archival research was also conducted at the SHPD library in Kapolei to identify historic properties and previous archaeological research in the vicinity.



Figure 6: Photograph of the Keāhua Stream Ford pre-flood, view to East (adapted from Powell et al. 2014)
The ford is lightly eroded but intact, and the Post-Contact wall is visible to the right, with the parking lot behind it on the rise.



Figure 7: Photograph of the Keāhua Stream Ford pre-flood, view to West (adapted from Powell et al. 2014)
Centered view of the intact ford.



**Figure 8: Photograph of the Keāhua Stream Ford post-flood, view to East
(adapted from Hart Crowser, Inc. 2019)**

The ford is badly damaged and missing its middle section. The wall is barely visible under the bridge and mostly intact. The parking lot is also present behind the bridge; part of a parked white car can be seen.

Field notes were recorded on SCS standard field forms and submitted to the SCS database. As no excavation occurred, stratigraphic profile drawings were not produced. Photographs were taken using the archaeologist's Samsung Galaxy 8 digital camera.

LABORATORY METHODOLOGY AND CURATION

As no artifacts were recovered during this survey, laboratory work consisted of cataloging field notes and photographs. All field notes and digital photographs have been curated at the SCS laboratory in Honolulu. All measurements were recorded in metric and true north compass orientation was employed.

RESULTS OF ARCHAEOLOGICAL FIELD INSPECTION

Full pedestrian survey of the area of potential effects not lead to the identification of any previously unrecorded historic properties. Brief descriptions of each crossing and accompanying photographs taken during the field inspection are presented below.

QUEENSLAND CROSSING

The primary focus of the field inspection, and first visited location, was the Queensland Crossing across Wailuā River (North Fork), which was most severely affected by the flooding. No historic properties or cultural deposits were identified in the vicinity of the crossing. Several basalt and cobble alignments and stacks were observed, but the alignments were assessed as modern construction, and the stacks as natural sorting created by hydrology. As the alignments were not present during an earlier visit to this site by Ms. Bledsoe, they must have been recently placed by visitors to the forest reserve, and may be intended as repairs to the damaged crossing.

Figure 9 is a photograph of the Queensland Crossing, and Figure 10 is a photograph of additional basalt boulder alignments near the Crossing.

NEW CROSSING

The next location visited was New Crossing created during the 2018 flood by a stream channel of Uhau'iole Stream. The Hart Crowser team named it "New Crossing" because it is located where the stream jumped its normal channel along the west side of the road and crossed the roadway, causing significant damage to the road. According to Hart Crowser's preliminary damage assessment and recommendations report (Hart Crowser, Inc. 2019), overflow from the stream had previously flowed through a culvert to the south, but since that culvert had been blocked as a result of the high water flow during the storm, the stream jumped channels and flowed through this location instead. At the time of the inspection, this location was dry, and the roadway had been temporarily repaired to allow traffic to pass.



Figure 9: Photograph of the damaged Queensland Crossing

Note the recently constructed boulder alignments connecting the concrete remnants of the original crossing.



Figure 10: Photograph showing additional basalt boulder alignments near Queensland Crossing

Figure 11 is a photograph of the basalt and concrete road crossing erected at New Crossing, and Figure 12 is a photograph of the repaired road.

KEĀHUA STREAM FORD

The last location visited was Keāhua Stream Ford across Keāhua Stream. The bridge was elevated enough to remain unaffected by the flooding, although the historic ford (Site -02248) has been severely damaged. Its central portion has been torn away by the waters, while the retaining wall (Site -02249) appears to be largely intact, though it may also have suffered some flood damage. No other historic properties or cultural deposits were identified in the vicinity of the crossing. As with Queensland Crossing, modern boulder alignments were observed, and at the time of the inspection, the crossing was in recreational use, with one such alignment under construction by local visitors.

Figure 13 is a photograph of Keāhua Stream Ford and Keāhua Stream Bridge, with a visible boulder alignment, and Figure 14 is a photograph of the Post-Contact retaining wall under the bridge.

DISCUSSION AND SUMMARY

The location of Līhu‘e-Kōloa Forest Reserve in the uplands of Wailuā Ahupua‘a places the area of potential effects in a region that does not seem to have been subject to permanent habitation in the Pre-Contact Era (and still is not in the modern day, as it has been designated a “forest reserve”). While it is known that the Pre-Contact Hawaiians did use part of the forest for manufacturing adze blanks and preforms and likely also gathered other resources, no signs of permanent habitation have been identified in this or previous archeological work on TMK (4) 4-2-001:002. Therefore, the lack of any previously undocumented archaeological sites encountered during this field inspection is unsurprising.

Of the few documented sites within the forest preserve, SIHP Site -04000 does not seem to extend to the area of potential effects and is therefore unlikely to be impacted. SIHP Site -02249, while within the area of potential effects at Keāhua Stream Ford, is also unlikely to be impacted by the proposed ford repair because of its position under the intact Keāhua Stream Bridge, which the work will likely avoid. SIHP Site -02248, the ford itself, will necessarily be impacted by the work, as its proposed goal is repairing it. Because there are no historic properties at other two water crossings, no additional archaeological sites should be affected by the proposed repairs.



Figure 11: Photograph of the concrete and basalt boulder road crossing erected (as repairs) at the New Crossing



Figure 12: Photograph of the (crudely repaired) passible road at the New Crossing



Figure 13: Photograph of Keāhua Stream Ford in recreational use

Note the boulder alignment connecting the concrete remnants of the original ford (as at Queensland Crossing)



Figure 14: Close-up photograph of the historic Post-Contact wall (Site-02249) underneath Keāhua Stream Bridge

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Honolulu District

U.S. Army Corps of Engineers



Nationwide Permit Pre-Construction Notification (PCN)

This PCN template integrates requirements of the U.S. Army Corps of Engineers (Corps) Nationwide Permit (NWP) Program with the Honolulu District (POH) NWP Regional Conditions. Boxes 1-10 should be completed to include all information required by NWP General Condition 32. Boxes 11 and 12 (or other sufficient information to show compliance with all NWP General and POH Regional Conditions) is also recommended to be completed for proposed activities seeking verification under the NWP Program. If additional space is needed, please provide as a separate attachment. Please refer to the *Instructions for the Honolulu District Nationwide Permit Pre-Construction Notification (PCN)* (Instructions) for instructions on completing the PCN.

To be completed by the Corps – do not fill-in

Application Number:	Date Received:	Date Complete:
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1. Prospective Permittee and Agent Contact Information (see Instructions)

a. Prospective Permittee

First - David Middle - G Last - Smith
 Company - DLNR, Division of Forestry and Wildlife Email Address - david.g.smith@hawaii.gov
 Address - 1151 Punchbowl St., Room 325 City - Honolulu State/Territory - HI Zip - 96813
 Phone (Residence/Mobile) - _____ Phone (Business) - (808) 587-0166

b. Agent (if applicable)

First - Janice Middle - _____ Last - Marsters
 Company - Haley & Aldrich, Inc. Email Address - jmarsters@haleyaldrich.com
 Address - 500 Ala Moana Blvd., Suite 6-250 City - Honolulu State/Territory - HI Zip - 96813
 Phone (Residence/Mobile) - 808.371.8504 Phone (Business) - 808.587.7747

c. Statement of Authorization: I hereby authorize Janice Marsters, to act on my behalf as my agent for the proposed activity. (Optional, see instructions)

Janice Marsters

May 2, 2023

Signature of Applicant

Date

2. Name and Location of the Proposed Activity (see Instructions)

The proposed work would involve multiple-single and complete projects. See attachment for the information required in Boxes 2 through 12, as applicable.

a. Project Name or Title: <u>Līhu'e-Kōloa Forest Reserve Queensland Low-Water Crossing</u>	b. City, County, Island, State/Territory: <u>Wailua, Kaua'i County, Kaua'i Island, Hawai'i</u>
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c. Name of Impacted Waterbody(ies):
Wailua River North Fork

d. Coordinates (in decimal format):
 Unknown (please provide other location descriptions below)
 Latitude - 22.065614 Longitude - -159.420708

e. Other Location Description (optional, see instructions):

The Proposed Activity occurs in TMKs 439001004, 442001002, and 439002001. The Queensland Low-Water Crossing is part of Wailua Forest Management Road within the Wailua section of Līhu'e-Kōloa Forest Reserve.

f. Directions to the site (optional, see instructions):

The Wailua section of the Līhu'e-Kōloa Forest Reserve is accessed from Highway 580 (Kuamo'o Road), which runs mauka from Wailua town to the Keāhūa Arboretum. From there, 4WD vehicles may proceed southbound into the Reserve along the Wailua Forest Management Road and continue approximately 0.75 mile until reaching the Queensland Low-Water Crossing. See Attachment A, Figure 1.

3. Specific NWP(s) you want to use to authorize the proposed activity (see Instructions)

NWP 3 – Maintenance

4. Description of the Proposed Activity (see Instructions)

a. Complete description of the Proposed Activity:

The Līhu'e-Kōloa Forest Reserve (Reserve) is managed by the Department of Land and Natural Resources (DLNR). Access to the Wailua section of the Reserve is via the Wailua Forest Management Road. During historic 2018 and 2020 flood events, the Reserve low-water crossings and other locations along the Wailua Forest Management Road were severely damaged, limiting public access to the Reserve. Approximately 80% of the 90-year-old concrete Queensland Low-Water Crossing (115 to 120 feet in length) on the Wailua River North Fork was washed away.

The proposed project involves the repair of the Queensland Low-Water Crossing. The proposed design includes removing remaining portions of the damaged crossing and replacing them with a new low-water crossing consisting of reinforced concrete boxes (RCB) spanning the stream and structurally tied together through a reinforced concrete slab poured on top of the RCBs. The RCBs will be anchored into a competent substrate to mitigate washout/sliding of the low-water crossing when high-velocity flows and/or large debris movement occurs. It is not anticipated that construction excavation will exceed 4 feet in depth. The crossing will include five-foot-wide concrete aprons upstream and downstream with a debris catcher on the upstream apron. The crossing will also include wingwalls along both banks upstream and downstream to prevent future scour of the crossing and roadway.

The project will also include construction of a new retaining wall, extending 108 feet south of the Crossing along the west side of the access road, to manage flood water from an upstream breach of the river that occurred in 2018. During high flow, water breached the channel and flowed through this area, further damaging the crossing and the roadway. The retaining wall is located outside of the ordinary high water mark (OHWM) and is intended to protect the access road from further damage during future flood events. The project also includes improvements to the access road north and south of the stream, and placement of grouted riprap along the roadsides and on the west side of the retaining wall. A small section of the grouted riprap extends into the OHWM to protect the wingwall on the south downstream side of the crossing, amounting to approximately 70 square feet, or 12 linear feet along the bank. Construction on the south side (outside of the OHWM) will also include grading along both sides of the road to direct stormwater runoff toward the stream and around the retaining wall.

b. Purpose of the Proposed Activity:

The purpose of the Proposed Activity is to repair the Queensland Low-Water Crossing, restoring access to the reserve via its main road.

c. Direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure:

The Proposed Activity will not affect any wetlands or special aquatic sites.

Direct adverse impacts could occur during demolition of remaining portions of the damaged crossing structure, and construction of the new crossing structure. Without appropriate measures, work within the stream could cause sedimentation in the water, which could impact in-stream species and could also travel downstream to the ocean. Work within the stream will be conducted "in the dry" in two phases by using sandbag berms to divert the stream around one-half the crossing at a time. A curtain wall will also be installed around the sandbag diversion. These best management practices will prevent direct adverse impacts.

An indirect adverse effect could occur if seabirds are damaged if work on the project during the night work requiring lights. Night work is not anticipated; however, if it is required, appropriate precautions will be taken.

No other direct or indirect adverse environmental effects are anticipated.

The project will restore the low-water crossing over the Wailua River North Fork. The constructed project is anticipated to provide beneficial direct impacts by providing a competent stream crossing so that vehicles are not driving through the stream at low water (likely occurring since the crossing was damaged). Indirect positive benefits would include the jobs and benefits to the community through purchasing materials and products during construction.

d. Description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity:

In-water work will occur during demolition of the remaining crossing components and construction of the new crossing. The in-stream work will be conducted in two phases to allow stream flow around the work area during construction. A full depth sandbag berm and curtain wall (providing double protection) will be used to isolate the work area from stream flow (see Drawing Nos. C-07 and C-08 in Attachment B). The sandbag berm will be stacked a minimum of four feet high and wrapped in geotextile fabric. The full-length curtain wall will be situated on the stream side of the sandbag berm. The curtain wall will be inspected regularly to verify that there are no tears and that the fabric is securely attached to the anchor ballast (see Drawing No. C-01, Water Pollution and Erosion Control Notes Item 3 in Attachment B).

Although night work is not anticipated, if unexpected conditions require night work during the autumn seabird fall season (September 15 through December 15), use of lighting shall be restricted between 9:00 PM to 4:30 AM so as to not attract seabirds that may fly over the site. If lighting of the work area is required during the seabird fall season, all lights shall be shielded and directed downwards to the maximum extent practicable. The contractor shall train all employees working at night how to rescue and handle downed birds and shall have appropriate equipment as approved by Save Our Shearwaters (SOS) on site to hold and transport any retrieved birds to an SOS facility. See Attachment B, Drawing No. C-01, Notes for General Construction.

e. Any other NWP(s), or Individual Permit(s) used or intended to be used to authorize any part of the proposed activity or any related activity including other separate and distant crossings for linear projects that require Department of the Army authorization:

No other NWPs or Individual Permits are intended for the Proposed Activity.

f. Have sketches been provided containing sufficient detail to show that the activity complies with the terms of the NWP and provide an illustrative description of the proposed activity? Yes, Attached No

See Attachment B - Civil Engineering Drawings.

5. Aquatic Resource Delineation (see Instructions)

a. Has a delineation of aquatic resources (wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams) been conducted in accordance with the current method required by the Corps? Yes No

See Attachment C - Jurisdictional Determination Report

If yes, please attach a copy of the delineation

Note: If no, your PCN is not complete. In accordance with General Condition 32, you may request the Corps delineate the special aquatic sites and other waters on the project site, but there may be a delay. In addition, the PCN will not be considered complete until the delineation has either been submitted to or completed by the Corps, as appropriate.

b. If a delineation has been submitted, would you like the Corps to conduct a jurisdictional determination (preliminary or approved)? Yes No

If yes, please complete, sign and return the attached *Appendix 1 – Request for Corps Jurisdictional Determination (JD)* sheet or provide a separate attachment with the information identified in Appendix 1.

6. Compensatory Mitigation (see Instructions)

a. Will the proposed activity result in the loss of greater than 1/10-acre of wetlands? Yes No

If yes, describe how you propose to compensate for the loss of each type of wetland:

Note: For the loss of less than 1/10 acre of wetlands, or if no compensatory mitigation is proposed, the Corps may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in no more than minimal adverse environmental effects.

b. Will the proposed activity result in the loss of streams or other open waters of the U.S.? Yes No

If yes, provide a description of any proposed compensatory mitigation for the loss of each type of stream or other open water:

Note: If no compensatory mitigation is proposed, the Corps may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in no more than minimal adverse environmental effects.

7. Endangered Species Act (ESA) Compliance (see Instructions)

a. For non-Federal permittees (if Federal permittee, check N/A and skip to 7(b)): N/A

(1) Is there any Federally-listed endangered or threatened species or designated critical habitat that might be affected or is in the vicinity of the activity? Yes No Unknown See Attachment D, Biological Survey Report.

(2) Is the activity located in designated critical habitat for Federally-listed endangered or threatened species? Yes No

If yes to either (1) or (2), include the name(s) of those endangered or threatened species that might be affected by the proposed activity or might utilize the designated critical habitat that might be affected by the proposed activity:

- | | |
|----|-----|
| 1. | 2. |
| 3. | 4. |
| 5. | 6. |
| 7. | 8. |
| 9. | 10. |

If no to both (1) and (2), proceed to Box 8.

Note: If yes to either (1) or (2), note per General Condition 18(c), you shall not begin work on the activity until notified by the Corps that the requirements of the ESA have been satisfied and that the activity is authorized.

b. For Federal permittees, you must provide documentation demonstrating compliance with ESA as a separate attachment. Documentation provided, see attached.

8. Historic Properties (see Instructions)

a. For non-Federal permittees (if Federal permittee, check N/A and skip to 7(d)): N/A

(1) Is there a known historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places that your proposed activity may have the potential to affect? Yes No

If yes to (1), state which historic property may have the potential to be affected by the proposed activity:

- | | |
|----|----|
| 1. | 2. |
| 3. | 4. |
| 5. | 6. |

OR

A vicinity map indicating the location of the historic property is enclosed

(2) If no to (1), describe the potential for the proposed work to affect a previously unidentified historic property:

The low-water crossing repair will occur within the same footprint as the existing structure and the proposed retaining wall construction will occur in an area previously disturbed by construction of the access road. An archaeological survey was conducted on June 29, 2021, in which no previously undocumented historic properties were found. The study indicated that, given the nature, location and scope of work proposed, it is highly unlikely that any historic properties will be identified and/or negatively impacted or disturbed during the proposed work on this property. See Attachment E. +

Note: If yes to (1), note per General Condition 20(c), you shall not begin the activity until notified by the Corps that the activity has no potential to cause effects or that consultation under Section 106 of the National Historic Preservation Act (NHPA) has been completed.

b. For Federal permittees, you must provide documentation demonstrating compliance with NHPA in a separate attachment. Documentation provided, see attached.

9. National Wild and Scenic Rivers (see Instructions)

a. Will the proposed activity occur in a component of the National Wild and Scenic River System or 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? Yes, in a component of a National Wild and Scenic River System; Yes, in a "study" river No

If yes, identify the Wild and Scenic River or the "study river":

Note: Per General Condition 16(b), you shall not begin the NWP activity until notified by the Corps that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status. If you have received written notification from the Federal agency, please attach the correspondence.

10. Section 408 Permissions (see Instructions)

a. Will the proposed activity also require permissions from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a Corps federally authorized Civil Works project? Yes No

If yes, have you received Section 408 permission to alter, occupy, or use the Corps project? Yes No

If yes, please attach the Section 408 permission

Note: If yes, note per General Condition 31, an activity that requires Section 408 permission is not authorized by NWP until the Corps issues the Section 408 permission to alter, occupy, or use the Corps project, and the Corps issues a written NWP verification.

11. Compliance with NWP General Conditions (see Instructions)

Check	General Condition	Rationale for Compliance with General Condition
<input checked="" type="checkbox"/>	1. Navigation	The Proposed Activity will not have any affect on navigation. The project is the repair of an existing low-water crossing.
<input checked="" type="checkbox"/>	2. Aquatic Life Movements	The Proposed Activity will not restrict access or movements of aquatic life. Stream diversion BMPs will be implemented in phases to prevent aquatic life from entering the project area while allowing passage of aquatic life around the project area.
<input checked="" type="checkbox"/>	3. Spawning Areas	The Proposed Activity site is not known to be a site with significant spawning activities and will not prevent upstream migration of aquatic organisms.
<input checked="" type="checkbox"/>	4. Migratory Bird Breeding Areas	The Proposed Activity site is not a migratory bird breeding area.
<input checked="" type="checkbox"/>	5. Shellfish Beds	The Proposed Activity site does not contain a concentrated shellfish population.
<input checked="" type="checkbox"/>	6. Suitable Material	No deleterious materials will be used in construction of the low-water crossing, retaining wall, or grouted riprap.
<input checked="" type="checkbox"/>	7. Water Supply Intakes	The Proposed Activity is not located near public water supply intakes.
<input checked="" type="checkbox"/>	8. Adverse Effects from Impoundments	The Proposed Activity does not create impoundments of water, accelerate the passage of water, or restrict the flow of water.
<input checked="" type="checkbox"/>	9. Management of Water Flows	The Proposed Activity will not affect the passage of normal or high flows. The activity will also not alter the pre-construction course, condition, capacity or location of the affected water body.
<input checked="" type="checkbox"/>	10. Fills Within 100-Year Floodplains	The Proposed Activity is not located within a FEMA-designated 100-year floodplain. It is in FEMA flood Zone X (unshaded) - area determined to be outside the 500-year flood.

<input checked="" type="checkbox"/>	11. Equipment	No heavy equipment will be working in wetlands. Best management practices (BMPs) will be used to minimize soil disturbance where heavy equipment is used.
<input checked="" type="checkbox"/>	12. Soil Erosion and Sediment Controls	Soil erosion and sediment control BMPs will be used and maintained. See Section 4(d).
<input checked="" type="checkbox"/>	13. Removal of Temporary Fills	The Proposed Activity involves the removal of temporary sandbag stream diversions after use is discontinued.
<input checked="" type="checkbox"/>	14. Proper Maintenance	The repaired low-water crossing will undergo maintenance, as needed, to ensure public safety and compliance with NWP conditions.
<input checked="" type="checkbox"/>	15. Single and Complete Project	The Proposed Activity is a single and complete project.
<input checked="" type="checkbox"/>	16. Wild and Scenic Rivers	No waters of the National Wild and Scenic Rivers System are located within the vicinity of the project.
<input checked="" type="checkbox"/>	17. Tribal Rights	Tribal rights, protected tribal resources, or tribal lands do not occur within vicinity of the project.
<input checked="" type="checkbox"/>	18. Endangered Species	A biological field investigation did not identify threatened or endangered species, nor is the site identified as essential habitat.
<input checked="" type="checkbox"/>	19. Migratory Bird and Bald and Golden Eagle Permits	The Proposed Activity does not require migratory bird or golden eagle permits.
<input checked="" type="checkbox"/>	20. Historic Properties	A literature review and field investigation found no historic properties that would be affected by the project.
<input checked="" type="checkbox"/>	21. Discovery of Previously Unknown Remains and Artifacts	In the event historic remains, such as artifacts, burials, or concentrations of shell or charcoal are encountered during construction activities, work shall immediately cease in the vicinity of the encounter and the State Historic Preservation Division (808) 692-8015 will be called to access the encounter and provide recommendations on mitigation measures.
<input checked="" type="checkbox"/>	22. Designated Critical Resource Waters	The Proposed Activity will not affect Critical Resource Waters.
<input checked="" type="checkbox"/>	23. Mitigation	See Section 4(d) and Section 6 on pages 3 and 4.
<input checked="" type="checkbox"/>	24. Safety of Impoundment Structures	The Proposed Activity does not include impoundment structures.
<input checked="" type="checkbox"/>	25. Water Quality	The Proposed Activity will conform with the applicable provisions of the water quality and water pollution control standards contained in HAR, Title 11, Chapters 54 and 55. The project qualifies for Hawaii's Blanket 401 permit with NWP #3 verification.
<input checked="" type="checkbox"/>	26. Coastal Zone Management	If the Army Corps verifies coverage under NWP#3, blanket coverage for CZM is assumed.

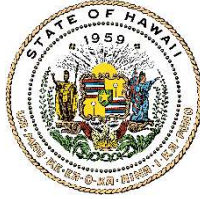
<input checked="" type="checkbox"/>	27. Regional and Case-by-Case Conditions	The Proposed Activity will comply with Regional Conditions.
<input checked="" type="checkbox"/>	28. Use of Multiple Nationwide Permits	Only one NWP is requested.
<input checked="" type="checkbox"/>	29. Transfer of Nationwide Permit Verifications	The Proposed Activity will not involve the transfer of property.
<input checked="" type="checkbox"/>	30. Compliance Certification	The Army Corps will provide a certification document with the NWP that must be signed by the permittee attesting compliance with the permit. The permittee will provide the certification document as requested within 30 days of completion of the project.
<input checked="" type="checkbox"/>	31. Activities Affecting Structures or Works Built by the United States	The Proposed Activity does not affect structures or works built by the United States.
<input checked="" type="checkbox"/>	32. Pre-Construction Notification	This PCN has been prepared and submitted to the USACE as required.

12. Compliance with NWP Regional Conditions (see Instructions)

Check	Regional Condition	Rationale for Compliance with Regional Condition
<input checked="" type="checkbox"/>	1. Revoked Permits	Revoked permits are not applicable to the Proposed Activity.
<input checked="" type="checkbox"/>	2. Limited Use Areas	Approximately half of the project footprint is located within the Conservation Use District. The project qualifies for DLNR's Site Plan Approval and CDU permitting will be processed internally.
<input checked="" type="checkbox"/>	3. Acreage Limitation	The Proposed Activity does not result in permanent loss to wetlands, other special aquatic sites, or other waters.
<input checked="" type="checkbox"/>	4. Stream Channelization and Impoundment Restriction	The Proposed Activity does not include stream channelization or the construction of dams that impound wetlands, other special aquatic sites, or other waters.
<input checked="" type="checkbox"/>	5. NWP Verification	No project activity will occur without written NWP verification from the USACE.
<input checked="" type="checkbox"/>	6. Pre-Construction Notification	We have provided a written PCN to the USACE that meets NWP General Condition #32.
<input checked="" type="checkbox"/>	7. Additional PCN Information	Additional information is provided in Attachments A - E.
<input checked="" type="checkbox"/>	8. Best Management Practices	See PCN Section 4(d) on page 3.
<input checked="" type="checkbox"/>	9. Bank Stabilization	The project is not a bank stabilization project. Please see Additional Information, Item 12.9 in Attachment F.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII'
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

ENGINEERING DIVISION
P.O. BOX 373
HONOLULU, HAWAII 96809

May 30, 2023

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

LAURA H.E. KAAKUA
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

TO: Dawn N.S. Chang, Chairperson

THROUGH: David Smith, Administrator 
Division of Forestry and Wildlife

FROM: Carty S. Chang, Chief Engineer 

SUBJECT: **Declare the Project Exempt from the Preparation of an Environmental Assessment under Chapter 343, HRS, and Title 11, Chapter 200.1, HAR – Exemption Notice**

**Job No. D00AK67B Lihue-Koloa Forest Reserve
Queensland Loop Road Low Water Crossing
Lihue, Kauai, Hawaii
TMK: (4) 3-9-01:004, (4) 3-9-02:001, & (4) 4-2-01:002**

At its meeting of July 8, 2022, under agenda Item L-1, the Board of Land & Natural Resources delegated authority to the Chairperson to declare a construction project exempt from the preparation of an environmental assessment.

The subject project triggers consideration with respect to Chapter 343, Hawaii Revised Statutes (HRS); however, in accordance with Chapter 11-200.1-15(c), Hawaii Administrative Rules (HAR), and the [Department of Land and Natural Resources Exemption List as reviewed and concurred by the Environmental Council on November 10, 2020](#), the subject project is exempt from the preparation of an environmental assessment. Additional information regarding the exemption classes is provided in Exhibit A - Exemption Notification.

The existing Queensland Low Water Crossing was damaged during two flooding events in March 2018 and May 2020. Due to these events, the structure is completely washed out, and crossing the stream has become difficult for most vehicles. The following describes the existing condition before flooding, the damages to the crossing due to the flooding events, and the proposed repairs for the crossing.

Previous (Existing) Structure

The existing crossing structure consisted of (10) 36" diameter corrugated metal pipes (CMP) culverts placed next to each other. A concrete slab was placed on top of the CMP pipes to make a 60 ft long by 14.5 ft wide crossing within the stream. On each side of the crossing, a concrete

approach slab was constructed, and each approach slab was approximately 25 ft long making the entire crossing structure 110 ft long. Beyond the approach slab, the access roads were dirt roads.

Damages

The 2018 and 2020 flooding events destroyed the structure completely and the roadway beyond the approach roadways. The length of the affected area is approximately 150 feet. Due to the force of the rushing water during the flood events, a portion of the stream bed was realigned on the upstream side of the crossing.

Proposed Repair Work

In order to restore the crossing, an 85 ft long x 15 ft wide structure will be placed within the stream. The new structure consists of a 3'-6"H x 4'W precast concrete box culverts spanning the stream and structurally tied together through a reinforced concrete slab poured on top of the box culverts. The length of the crossing is increased to accommodate the stream widening due to flooding. Attached to the reconstructed crossing will include 5 feet wide concrete aprons upstream and downstream of the crossing with a debris catcher on the upstream apron to prevent clogging of the box culverts. Wingwalls, which are needed along both banks upstream and downstream to prevent scour of the crossing and roadway will be built.

In addition, the project will also include construction of a new retaining wall, extending 114 feet south of the crossing along the west side of the access road, to manage flood water from an upstream breach of the river that occurred in 2018. During that flood event, water breached the channel and flowed through this area, further damaging the crossing and the roadway. The retaining wall is intended to protect the access road from further damage during future flood events. The project also includes improvements to the access road north and south of the stream, and placement of grouted riprap along the roadsides and on the west side of the retaining wall. Grading of the roadway will be conducted as necessary to provide transition from the road to the low-water crossing.

Additional information regarding the exemption classes is provided in Exhibit A - Exemption Notification.

RECOMMENDATION

Declare that, after considering the potential effects of the proposed project, as provided by Chapter 343, HRS, and Chapter 11-200.1, 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. This includes considering the cumulative impacts of planned successive actions in the same area and over time, and whether this action may be significant in a particularly sensitive environment.

Attachment: Exhibit A

c: Project Control Branch (DLNR.EN.ProjectControl@hawaii.gov)
Division of Forestry and Wildlife (mapuana.r.osullivan@hawaii.gov)

Exhibit A

EXEMPTION NOTIFICATION

Regarding the preparation of an environmental assessment pursuant to Chapter 343, HRS, and Chapter 11-200.1, HAR

DLNR Job No.	D00AK67B
DLNR Title:	Lihue-Koloa Forest Reserve Queensland Loop Road Low Water Crossing, Lihue, Kauai, Hawaii
File Number:	ENG. D00AK67B
Island:	Kauai
Location: Street Address/ City/ Zipcode:	Loop Road, the public access road to the Lihue-Koloa Forest Reserve
TMK Number:	TMK: (4) 4-2-01:002
Applicant/Agency:	DLNR/DOFAW
Project Description:	The project consists of reconstruction of the existing Queensland Low Water Crossing, including ancillary structures such as the concrete apron and debris catchment, retaining walls, swales, and improvements to the existing access road north and south of the crossing.
Chapter 343 Trigger(s):	Use of State Funds and Lands
Exemption Type 2 & 3 per HAR Chapter 11-200.1-15(c), Part, Item# per DLNR Exemption List (approved by OEQC on 11/10/2020):	<p>Exemption Type 2 <i>Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced.</i>"</p> <p>PART 2 11. Replacement or reconstruction of existing bridges and flumes.</p> <p>Exemption Type 3 <i>Construction and location of single, new, small facilities or structures and the alteration and modification of the facilities or structures and installation of new, small equipment or facilities and the alteration and modification of the equipment or facilities, including, but not limited to:"(D) Water, sewage, electrical, gas, telephone, and other essential public utility services extensions to serve such structures or facilities; accessory or appurtenant structures including garages, carports, patios, swimming pools, and fences; and, acquisition of utility easements."</i></p>

	<p>PART 1</p> <p>4. Construction of drainage swales and structures and other similar surface runoff management techniques with minimal or no effect on the environment.</p> <p>PART 2</p> <p>2. Construction and location of new, small facilities or structures necessary to support or enhance safe and effective management of lands and waters, such as baseyards, caretaker's residences, work cabins and shelters, sanitation facilities, and other similar structures.</p> <p>4. Construction of roadways with distances less than 1,000 yards (excluding access roads) and walkways.</p>
<p>Cumulative Impact of Planned Successive Actions in Same Place Significant?</p>	<p>No. There will be no cumulative impact on the project site as there are no planned successive actions in this area.</p>
<p>Action May Have Significant Impact on Particularly Sensitive Environment?</p>	<p>No. The project will not have a significant impact on a particularly sensitive environment.</p>
<p>Analysis:</p>	<p>This project will have no significant adverse primary, secondary, or cumulative impacts to the physical or social environment. All anticipated impacts are expected to be temporary in duration and will not adversely impact the environmental quality of the area.</p> <ol style="list-style-type: none"> 1. Land Use and Zoning Conformance: The project does not involve any change in land use or zoning. 2. Traffic (Vehicles, Pedestrian): Changes to vehicular traffic patterns during the construction period will be temporary. Loop Road (the Forest Reserve management road) would be blocked at the Queensland Crossing during construction; however, flood damage to the crossing has already restricted most vehicular traffic. Access would be restored following completion of the project. 3. Infrastructure (Roads, Buildings, Utilities): During construction, the low-water crossing and access to the

	<p>Loop Road in the vicinity of the crossing will be temporarily blocked. However, reconstruction of the low-water crossing will have a long-term positive impact on infrastructure within the Reserve and reinstate access to this area of the reserve. There are no buildings or utilities near the project area.</p> <ol style="list-style-type: none">4. Air Quality Pollutant Emissions: Short-term air quality impacts could occur from construction activities. Standard Best Management Practices (BMPs) will be implemented to mitigate fugitive dust during construction. The contractor will be required to meet air emissions regulations for construction equipment. There will be no long-term impacts on air quality.5. Noise Emissions: The proposed project could have noise emission impact during construction. However, the project location within the Reserve is remote and there are no residential communities within the vicinity of the project area. Contractors will adhere with State Department of Health community noise regulations. There will be no long-term impacts due to noise.6. Solid, Hazardous, and Liquid Waste Management: Demolition of a portion of the remaining crossing will result in solid waste in the form of concrete and miscellaneous construction and demolition material. The Contractor shall comply with federal, state, and local standard for disposal of all waste generated by the project.7. Social: The project is anticipated to have only a beneficial long-term impact on social factors, due to the improved access to the Reserve.8. Economic: The short-term purchase of labor and material will benefit construction trades and material suppliers; the State of Hawaii will benefit from excise taxes on material purchases and payroll taxes for labor. The project will not change the use of the Reserve in any way other than reinstating access to this area of the Reserve, which does not require access fees. Adverse economic impacts are not anticipated.
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	<p>9. Health and Safety: The project is in a remote area of the Reserve. Safety barriers and signage will be placed at the entrance and exit of the construction site to mitigate potential public health and safety impacts by completely blocking off access to the construction area. Personal protective equipment will be enforced for workers. The project will have a positive impact on health and safety for those using the park by reinstating safer passage across Wailua River North Fork.</p> <p>10. Recreation: Construction of the proposed project will have a positive long-term impact to recreational activities by reinstating access to a large segment of the Reserve. During construction, there may be short-term impacts to recreation due to blocking traffic at the crossing. However, the existing damage to the crossing has already restricted most vehicular traffic.</p> <p>11. Cultural Resources and Practices: Access to the Reserve for hunting, fishing, and access to the forest for other gathering practices would be improved by the proposed project. A literature review and field investigation did not find any indication of archaeological resources that would be affected by the project. The report has been submitted to the State Historic Preservation Division for concurrence and to comply with the State's 6E requirements.</p> <p>12. Visual/Aesthetic: The proposed project is situated on a remote Reserve roadway that is not part of any scenic vista. The proposed project will provide no impact to visual/aesthetic resources.</p> <p>13. Environmental Justice: The proposed project is not situated in a location that provides concerns regarding environmental justice. The project provides a positive impact by reinstating access for all to the Reserve, a resource valued by the community.</p> <p>14. Rare, Threatened, and/or Endangered Species: A biological survey did not find any indication of threatened or endangered species that would be affected by the proposed project. The project location is not situated within identified essential habitat for threatened or endangered species.</p>
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	<p>15. Surface and Ground Water Resources: The proposed project will be constructed within the jurisdictional waters of a perennial waterway, the Wailua River North Fork. The project does not change the alignment or restrict the flow of the stream, and no long-term impacts are anticipated. Potential short-term impacts such as sedimentation or contamination of the stream will be mitigated with use of construction BMPs. The project would have no effect on ground water resources.</p> <p>16. Wetlands: An evaluation for wetlands determined that there are no wetlands within the proposed project footprint, and none would be affected by the project. The proposed project occurs in FEMA Flood Zone X, which consists of areas with a 0.2% annual chance of flood and areas of 1% annual chance of flood with average depths of less than one foot. The proposed project consists of replacing the existing damaged low-water crossing and installing a culvert under Wailua Forest Management Road adjacent to the crossing in such a way that will minimize future damage to the crossing and road during high level flood events. The project will not have any long-term impacts on the floodplain.</p> <p>17. Floodplains: The proposed project occurs in FEMA Flood Zone X, which consists of areas with a 0.2% annual chance of flood and areas of 1% annual chance of flood with average depths of less than one foot. The proposed project consists of replacing the existing damaged low-water crossing and in such a way that will minimize future damage to the crossing and road during high level flood events. The project will not have any impacts on the floodplain or the watershed's flood capacity.</p> <p>18. Riparian/Coastal Resources: The proposed project does not affect coastal resources, but has riparian areas next to the stream. The project involves work along the streambank, i.e., the installation of riprap no more than 12 feet upstream or downstream of the crossing. The riprap is designed to prevent damage to the new crossing from future storms and does not significantly affect riparian resources.</p>
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	<p><u>MITIGATION</u> BMPs will be implemented to address fugitive dust, storm water impacts, solid/hazardous material handling and disposal and noise control. Workers will wear personal safety devices and will clean the work areas each day. Required safety barriers and protection will be installed and utilized during construction.</p>
Consulted Parties:	DLNR, Division of Engineering DLNR, Office of Conservation and Coastal Lands
Declaration:	The Department finds that 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.



Dawn N.S. Chang, Chairperson

May 30, 2023

Date

STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

FOR
 DIVISION OF FORESTRY AND WILDLIFE

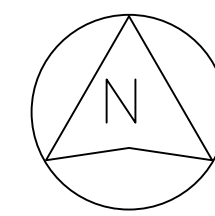
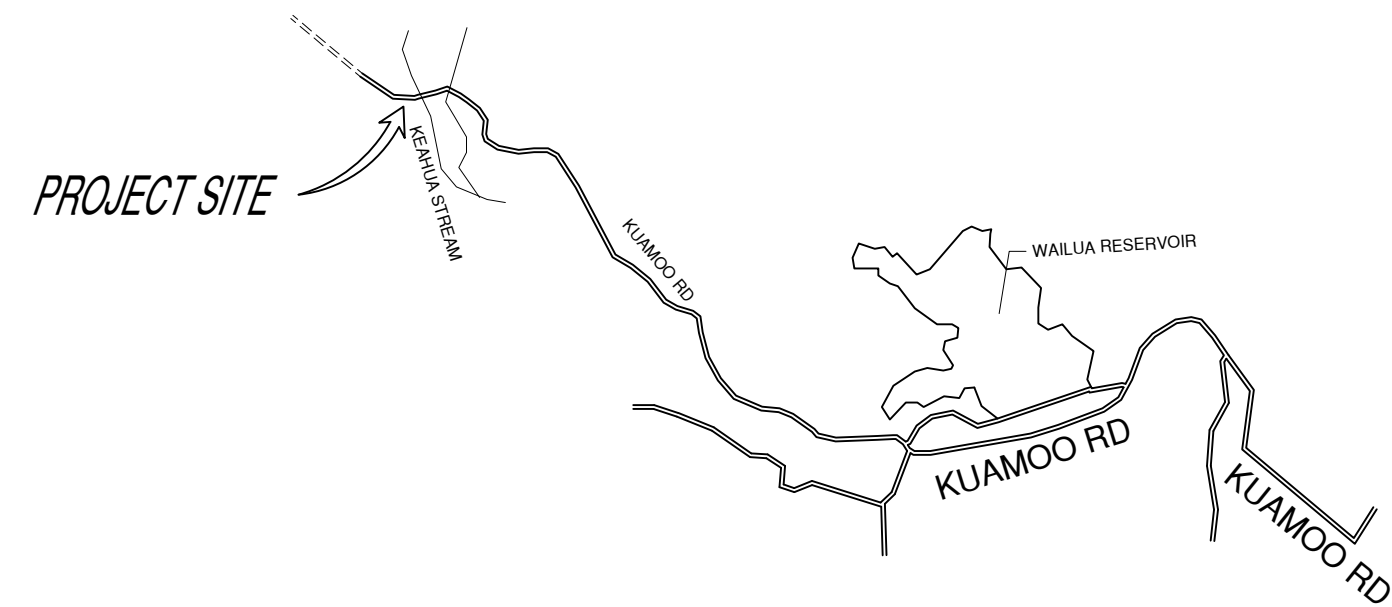
JOB NO. D00AK67B

LIHUE-KOLOA FOREST RESERVE

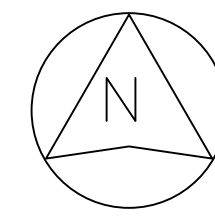
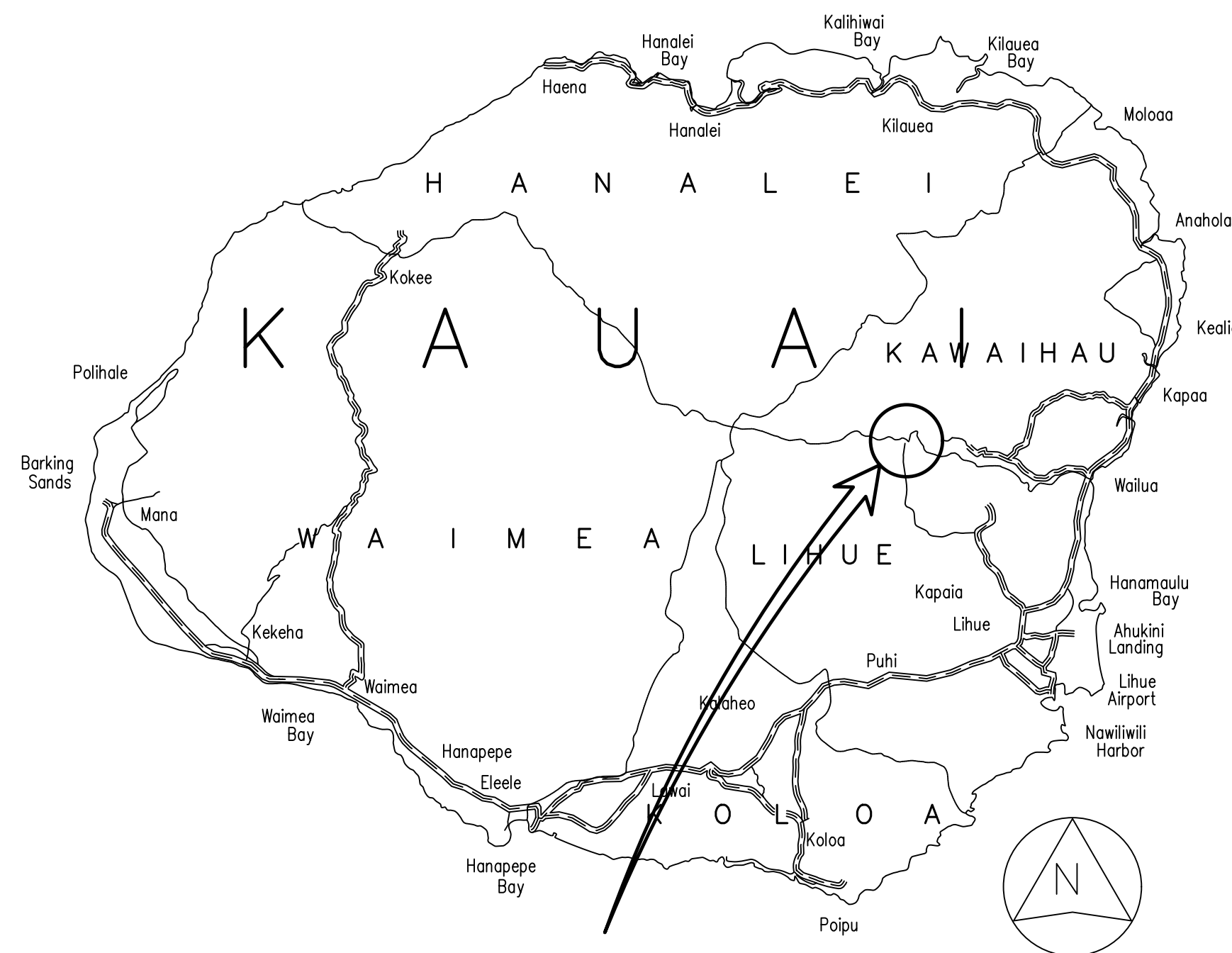
QUEENSLAND LOOP ROAD LOW WATER CROSSING

KAUAI, HAWAII

T.M.K.: 4-4-2-001-002



LOCATION MAP
 NOT TO SCALE



SITE LOCATION

ISLAND OF KAUAI
 NOT TO SCALE

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SCOPE OF WORK: WORK SHALL GENERALLY CONSIST OF PROVIDING CONCRETE BOX CULVERTS AND RETAINING WALLS AT THE QUEENSLAND CROSSING. THE CULVERTS AND RETAINING WALLS WILL PREVENT FUTURE WASHOUT DUE TO FLOODING.

APPROVED: _____ DATE: _____

DAVID G. SMITH
 ADMINISTRATOR
 DIVISION OF FORESTRY AND WILDLIFE
 DEPARTMENT OF LAND AND NATURAL RESOURCES

APPROVED: _____ DATE: _____

CARTY S. CHANG, P.E.
 CHIEF ENGINEER
 ENGINEERING DIVISION
 DEPARTMENT OF LAND AND NATURAL RESOURCES

JOB NO. D00AK67C LIHUE-KOLOA FOREST RESERVE, KEAHUA AND QUEENSLAND LOW WATER CROSSINGS

NOTES FOR GENERAL CONSTRUCTION

1. ALL CONSTRUCTION WORK IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE PUBLICATIONS "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AND ITS AMENDMENTS AND THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984", AS AMENDED, BY THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI AND HAWAII. THE STANDARD DETAILS ARE AVAILABLE AT THE COUNTY OF KAUAI CLERK'S OFFICE.
2. CONSTRUCTION SHALL BE DONE IN SUBSTANTIAL CONFORMANCE WITH GEOTECHNICAL ENGINEERING REPORT "LIHUE-KOLOA FOREST RESERVE QUEENSLAND CROSSING" DATED AUGUST 19, 2021 BY HART CROWSER WHERE APPLICABLE.
3. TOPOGRAPHIC INFORMATION OBTAINED FROM "TOPOGRAPHIC MAP SHOWING QUEENSLAND CROSSING" PREPARED BY ESAKI SURVEYING & MAPPING, MAY 4, 2021. THIS TOPOGRAPHIC SURVEY WAS BASED ON THE BEST AVAILABLE INFORMATION AND ACCURACY MUST BE VERIFIED PRIOR TO STARTING CONSTRUCTION.
4. ALL COORDINATES, GRIDS AND AZIMUTHS ARE REFERRED TO KEAHUA BRIDGE-KUAMOO ROAD"
5. ELEVATIONS SHOWN ON THE PLANS ARE BASED ON MEAN SEA LEVEL DATUM BENCH MARK IS SHOWN ON SHEET C-04.
6. SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, COUNTY OF KAUAI, SEPTEMBER 1984, AND ITS AMENDMENTS.
7. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL CONTACT THE VARIOUS UTILITY AGENCIES FOR LOCATION OF EXISTING UTILITIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS. ANY COSTS INCURRED BY DAMAGES TO EXISTING UTILITIES WILL BE BORNE BY THE CONTRACTOR.
8. ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED.
9. WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATION AND DEPTH.
10. ALL TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, CURRENT EDITION.
11. THE CONTRACTOR SHALL MAKE PROPER ARRANGEMENTS FOR THE USE OF UTILITIES SUCH AS ELECTRICITY, WATER, ETC. AND SHALL BE RESPONSIBLE FOR THE PAYMENT OF ALL COSTS RESULTING FROM SUCH USAGE.
12. SURVEYS SHALL BE DONE UNDER THE SUPERVISION OF A LAND SURVEYOR LICENSED IN THE STATE OF HAWAII.
13. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT OF LAND AND NATURAL RESOURCES, ENGINEERING DIVISION, INSPECTION SECTION AT LEAST FIVE (5) WORKING DAYS BEFORE COMMENCING ANY WORK ON THE PROJECT. THE CONTRACTOR SHALL HOLD A PRECONSTRUCTION MEETING WITH THE CONSTRUCTION SECTION OF DLNR BEFORE COMMENCING ANY WORK.
14. CONTRACTOR SHALL SUBMIT 'AS-BUILT' PLANS WITHIN 14 DAYS AFTER FINAL INSPECTION, INCLUDING STREET MONUMENT DATA (ELEVATIONS & LOCATION) DONE BY A LICENSED SURVEYOR, REGISTERED IN THE STATE OF HAWAII.
15. IF SYSTEM CONDITIONS REQUIRE NON-EMERGENCY NIGHT TIME WORK DURING THE AUTUMN SEABIRD FALL SEASON (SEPTEMBER 15 THROUGH DECEMBER 15), USE OF LIGHTING SHALL BE RESTRICTED BETWEEN 9:00 PM TO 4:30 AM. IF LIGHTING OF THE WORK AREA IS REQUIRED IN SUCH SITUATION, ALL LIGHTS SHALL BE SHIELDED (MINIMUM LIGHT SPILL TOWARDS THE SKY) AND DIRECTED DOWNWARDS TO THE MAXIMUM EXTENT PRACTICABLE. MINIMUM REQUIREMENTS FOR LIGHTING BY HIOSH AND OSHA SHALL BE PROVIDED AND ASSURED BY THE CONTRACTOR. THE CONTRACTOR SHALL TRAIN ALL EMPLOYEES WORKING AT NIGHT (RECORDS RETAINED BY THE CONTRACTOR) IN HOW TO HANDLE ANY RETRIEVED DOWNED BIRDS AND SHALL HAVE APPROPRIATE EQUIPMENT AS APPROVED BY SAVE OUR SHEARWATERS (SOS) ON SITE TO HOLD AND TRANSPORT ANY RETRIEVED BIRDS TO A SOS FACILITY. THIS REQUIREMENT DOES NOT ALLOW LIGHTING AS MAY BE RESTRICTED BY OTHER GOVERNMENT AGENCIES.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OVERTIME AND/OR NIGHT WORK PAYMENTS FOR COUNTY'S STAFF INSPECTION PERSONNEL INCLUDING CONSULTANTS WHEN THE CONTRACT REQUIRES OVERTIME OR NIGHT WORK TO BE PERFORMED, OR DIRECTS THE CONTRACTOR TO WORK ADDITIONAL SHIFTS OR OVERTIME FOR COUNTY'S CONVENIENCE.
17. ALL GRADING, GRUBBING AND STOCKPILING WORK SHALL BE PERFORMED IN ACCORDANCE WITH COUNTY OF KAUAI ORDINANCE NO. 808.

18. AFTER EACH RAINFALL EVENT, THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS, AND OTHER AREAS. THE COST INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE COUNTY ENGINEER SHALL BE PAYABLE BY THE CONTRACTOR.
19. DURING CLEANING OPERATIONS, THE CONTRACTOR SHALL SUPPLY A WATER TRUCK FOR DUST CONTROL PURPOSES UNTIL THE VEGETATION HAS RE-ESTABLISHED ITSELF. EXCESS WATER, INCLUDING SILT AND DIRT, SHALL NOT BE ALLOWED TO RUN-OFF THE PROPERTY.
20. BENCHMARKS THAT ARE DISTURBED OR DESTROYED SHALL BE RESTORED UNDER A LICENSED LAND SURVEYOR'S DIRECTION. COPIES OF FIELD NOTES, DESCRIPTIONS AND NEW VALUES OF THE NEW BENCHMARK SHALL BE SENT TO THE DEPARTMENT OF PUBLIC WORKS SURVEY SECTION FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
21. BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE EMPLOYED AT ALL TIMES TO THE MAXIMUM EXTENT PRACTICABLE TO PREVENT DAMAGE BY SEDIMENTATION, EROSION OR DUST TO STREAMS, WATERCOURSES, NATURAL AREAS AND THE PROPERTY OF OTHERS.
22. DLNR WILL DELEGATE THE CONTRACTOR AS THE AUTHORIZED REPRESENTATIVE TO SUBMIT ALL NECESSARY DOCUMENTS AND REPORTS AS REQUIRED BY THE COUNTY AND DOH DIRECTLY TO THEIR OFFICES AT NO COSTS TO THE STATE.
23. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DIRECTION.
24. AT ALL TIMES DURING PERFORMANCE OF THIS CONTRACT, ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE SITE SAFETY CONDITIONS FOR ALL PERSONS AND PROPERTY.
25. HARD BOULDERS AND MEDIUM HARD TO HARD BASALT ROCK MAY BE ENCOUNTERED NEAR OR AT THE SITE. APPROPRIATE EQUIPMENT FOR EXCAVATING THE MEDIUM HARD TO HARD BASALT ROCK SHALL BE REQUIRED.
26. NO BLASTING SHALL BE ALLOWED ON THIS PROJECT.
27. CONSTRUCT TEMPORARY BARRICADES DURING CONSTRUCTION, FOR THE PROTECTION OF LIFE, SAFETY, AND PROPERTY.
28. THE LIHUE-KOLOA FOREST RESERVE SHALL REMAIN OPEN DURING THE CONSTRUCTION PERIOD. PROVIDE TEMPORARY BARRICADES AND WARNING SIGNS TO PROTECT THE PUBLIC DURING THE CONSTRUCTION PERIOD. PROVIDE AND MAINTAIN FOR SAFE PEDESTRIAN ACCESS AND VEHICLE ACCESS TO THE FACILITY THROUGHOUT THE CONSTRUCTION PERIOD.
29. PROVIDE AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND TAKE NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.
30. EXISTING PEDESTRIAN WALKWAYS SHALL BE MAINTAINED IN A PASSABLE CONDITION OR PROVIDE FOR ALTERNATE/TEMPORARY ACCESSIBLE PEDESTRIAN ACCESS ROUTES AND FACILITIES PER THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN CHAPTER 2 AND ADAAG 201.3 AND ADAAG 206.1.
31. NO PERFORMANCE OF ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION SHALL BE PAYABLE BY THE CONTRACTOR.
32. COORDINATE CONSTRUCTION ACTIVITIES WITH ANY ADJACENT OR RELATED CONSTRUCTION ACTIVITIES ON ANOTHER CONSTRUCTION SITE. AVOID DELAY OR HINDRANCE IN THE PERFORMANCE OF THEIR RESPECTIVE CONTRACTS.
33. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS 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. ALL DAMAGED PORTIONS SHALL BE REPLACED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE AFFECTED UTILITY COMPANY AND SHALL BE THE CONTRACTORS RESPONSIBILITY. PERSONAL INJURY RESULTING FROM CONTACT WITH EXISTING UTILITIES SHALL BE THE CONTRACTORS RESPONSIBILITY.
34. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTION POINT TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR NEW LINES.
35. NOTIFY ALL AGENCIES AND UTILITY COMPANIES TO VERIFY THE ACTUAL LOCATION OF ALL SITE UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATION.
36. NOTIFY AND COORDINATE ALL SITE WORK WITH THE ONE CALL CENTER AT (866) 423-7287 AT LEAST 5 WORKING DAYS PRIOR TO THE START OF EXCAVATION OR TRENCHING.

37. IF WATER, SEWAGE, OR ELECTRICAL SERVICES ARE PLANNED TO BE INTERRUPTED FOR MORE THAN 1 HOUR, PROVIDE TEMPORARY WATER, SEWAGE, AND ELECTRICAL SERVICES DURING THE INTERRUPTION AT NO ADDITIONAL COST TO THE STATE.
38. ADJUST MANHOLE AND/OR VALVE BOX FRAMES AND COVERS AS REQUIRED BY THE UTILITY COMPANIES.
39. CONFORM WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, HAWAII ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.
40. OBTAIN AND PAY FOR ALL REQUIRED PERMITS FROM THE APPROPRIATE GOVERNMENT AGENCIES.
41. RESTORE ALL AREAS DISTURBED AS A RESULT OF ALL CONSTRUCTION ACTIVITIES, TO EQUAL OR BETTER CONDITION(S), INCLUDING BUT NOT LIMITED TO VEGETATION, PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALKWAYS, FENCES, ETC. UNLESS SPECIFICALLY NOTED OTHERWISE.
42. IF ONE (1) OR MORE ACRE OF LAND IS DISTURBED, DO NOT START GROUND DISTURBANCE UNTIL A NPDES PERMIT IS OBTAINED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII, AND HAS SATISFIED ALL OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM. ALSO, FOR COUNTY PROJECTS, PROVIDE A WRITTEN COPY OF THE NPDES PERMIT TO THE APPROPRIATE COUNTY OR GOVERNMENTAL AGENCY PER THEIR REQUIREMENTS.
43. ALL STRIPING SHALL BE A THERMOPLASTIC TYPE.
44. PROVIDE THEFT-RESISTANT FASTENERS FOR ALL ACCESSORY MOUNTINGS. ALL FASTENERS SHALL BE STAINLESS STEEL WITH THEFT-RESISTANT TYPE HEADS OR NUTS.
45. PROVIDE ALL INCIDENTAL AND NECESSARY WORK TO COMPLETE THE PROJECT.
46. THE JOB SITE SHALL BE LEFT IN A SAFE, SECURE CONDITION AT THE END OF EACH CONSTRUCTION WORKDAY. CLEAN UP AND REMOVE, FROM THE JOB SITE, ALL RUBBISH AND MAINTAIN THE PREMISES IN A CLEAN ORDERLY CONDITION AT ALL TIMES.
47. UPON COMPLETION OF CONSTRUCTION THE ENTIRE JOB SITE SHALL BE CLEANED OF ALL RUBBISH AND DEBRIS.

HISTORICAL PRESERVATION NOTES

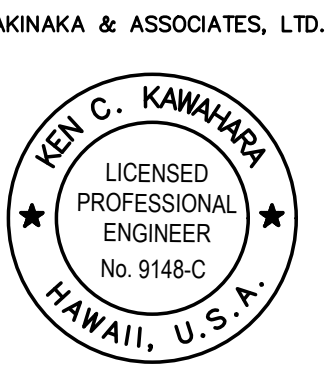
1. SHOULD HISTORIC REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF SHELL OR CHARCOAL BE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES, WORK SHALL CEASE IMMEDIATELY IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL CORDON OFF THE AREA AND IMMEDIATELY NOTIFY THE PLANNING DEPARTMENT AT (808) 241-4050 AND THE STATE HISTORIC PRESERVATION DIVISION AT (808) 692-8015, WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND THE APPROPRIATE MITIGATION MEASURES, IF NECESSARY. IN ADDITION, IF HUMAN BURIALS ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY OF KAUAI POLICE DEPARTMENT.

WATER POLLUTION AND EROSION CONTROL NOTES

1. GENERAL:
 - A. THE CONTRACTOR IS REMINDED OF THE REQUIREMENTS OF SECTION 209-WATER POLLUTION AND EROSION CONTROL AND SECTION 620-DUST CONTROL, IN THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AND ITS AMENDMENTS. SECTION 209 DESCRIBES BUT IS NOT LIMITED TO: SUBMITTAL REQUIREMENTS; SCHEDULING OF A WATER POLLUTION AND EROSION CONTROL CONFERENCE WITH THE COUNTY; CONSTRUCTION REQUIREMENTS; METHOD OF MEASUREMENT; AND BASIS OF PAYMENT. NO WORK SHALL COMMENCE WITHOUT A BMP PLAN APPROVED BY THE DEPARTMENT OF HEALTH.
 - B. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE "INTERIM BEST MANAGEMENT PRACTICES MANUAL FOR CONSTRUCTION SITES FOR COUNTY OF KAUAI" IN DEVELOPING, INSTALLING AND MAINTAINING THE BEST MANAGEMENT PRACTICES (BMPs) FOR THE PROJECT. THE CONTRACTOR MAY SUBMIT ALTERNATE METHODS TO THE COUNTY FOR ACCEPTANCE.
 - C. THE CONTRACTOR SHALL KEEP A COPY OF THE APPROVED BMP PLAN, NOI, ETC. ON THE PROJECT SITE. THE BMP PLAN SHALL BE UPDATED TO REFLECT ANY CHANGES MADE DURING THE COURSE OF CONSTRUCTION FOR THE DURATION OF THE PROJECT.
 - D. THE DLNR MAY ASSESS LIQUIDATED DAMAGES OF UP TO \$27,500 FOR NONCOMPLIANCE OF EACH BMP REQUIREMENT AND EACH REQUIREMENT STATED IN SECTION 209, FOR EVERYDAY OF NONCOMPLIANCE. THERE IS NO MAXIMUM LIMIT ON THE AMOUNT ASSESSED PER DAY.
 - E. THE DLNR MAY DEDUCT THE COST FROM THE PROGRESS PAYMENT FOR ALL CITATIONS RECEIVED BY THE DEPARTMENT FOR NON-COMPLIANCE, OR THE CONTRACTOR/OWNER SHALL REIMBURSE THE STATE AND/OR COUNTY FOR THE FULL AMOUNT OF THE OUTSTANDING COST INCURRED BY THE STATE AND/OR COUNTY.

2. WASTE DISPOSAL:
 - A. WASTE MATERIALS: ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER THAT DOES NOT LEAK. THE DUMPSTER SHALL MEET ALL LOCAL AND STATE SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER SHALL BE EMPTIED A MINIMUM OF TWICE PER WEEK OR AS OFTEN AS IS DEEMED NECESSARY. NO CONSTRUCTION WASTE MATERIAL SHALL BE BURIED ONSITE. THE CONTRACTOR'S SUPERVISORY PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THESE PRACTICES SHALL BE POSTED IN THE OFFICE TRAILER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.
 - B. HAZARDOUS WASTE: ALL HAZARDOUS WASTE MATERIAL SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATIONS OR BY THE MANUFACTURER. THE CONTRACTOR'S SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES AND SHALL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES FOR FOLLOWED.
 - C. SANITARY WASTE: ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK, OR AS REQUIRED.
3. EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES:
 - A. ALL CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EACH WEEK AND WITHIN 24 HOURS FOLLOWING ANY RAINFALL EVENT OF 0.5 INCHES OR GREATER.
 - B. ALL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER. IF REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS AFTER THE INSPECTION.
 - C. BUILT UP SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE FENCE.
 - D. SILT SCREEN OF FENCE SHALL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, TO VERY THAT THE FABRIC FENCE IS SECURELY ATTACHED TO THE FENCE POST OR CONCRETE SLAB AND TO VERIFY THAT THE FENCE POST ARE FIRMLY IN THE GROUND
 - E. TEMPORARY AND PERMANENT SEEDING AND PLANTING SHALL BE INSPECTED FOR BARE SPOTS, WASH OUTS AND HEALTHY GROWTH.
 - F. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A MAINTENANCE INSPECTION REPORT PROMPTLY AFTER EACH WEEKLY INSPECTION.
 - G. THE CONTRACTOR SHALL SELECT A MINIMUM OF THREE PERSONNEL WHO SHALL BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE AND REPAIR ACTIVITIES AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.
 - H. PERSONNEL SELECTED FOR THE INSPECTION AND MAINTENANCE RESPONSIBILITIES SHALL RECEIVE TRAINING FROM THE CONTRACTOR. THEY SHALL BE TRAINED IN ALL THE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS USED ONSITE IN GOOD WORKING ORDER.
 - I. ALL SLOPES AND EXPOSED AREAS SHALL BE GRASSED AS FINAL GRADES HAVE BEEN ESTABLISHED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA IN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED OR EXPOSED FOR MORE THAN 15 DAYS SHALL BE GRASSED IN ORDER TO PREVENT DUST EMISSION, EROSION AND SILT RUNOFF. AREAS WITH IMPORTED SOILS SHALL BE GRASSED NOT MORE THAN 5 WORKING DAYS AFTER THE FINAL GRADES HAVE BEEN ESTABLISHED.
 - J. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

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REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
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DESIGNED: GMG		SUBMITTED:			
DRAWN: KJM/ARK		DATE: AUG 2021			
CHECKED: KCK		SCALE: AS SHOWN			
APPROVED: _____		DRAWING NO. C-01			
CHIEF ENGINEER		DATE			

WATER POLLUTION AND EROSION CONTROL NOTES (CON'T)

4. GOOD HOUSE KEEPING BEST MANAGEMENT PRACTICES:

A. MATERIALS POLLUTION PREVENTION PLAN.

- a. APPLICABLE MATERIALS OR SUBSTANCES LISTED BELOW ARE EXPECTED TO BE PRESENT ONSITE DURING CONSTRUCTION. OTHER MATERIALS AND SUBSTANCES NOT LISTED BELOW SHALL BE ADDED TO THE INVENTORY OF THE CONSTRUCTION CONTRACTOR'S SITE-SPECIFIC BMP PLAN.

CONCRETE	FERTILIZERS
DETERGENTS	PETROLEUM BASED PRODUCTS
PAINTS (ENAMEL & LATEX)	CLEANING SOLVENTS
METAL STUDS	WOOD
TAR	MASONRY BLOCK

- b. MATERIAL MANAGEMENT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF. AN EFFORT SHALL BE MADE TO STORE ONLY ENOUGH PRODUCT AS IS REQUIRED TO DO THE JOB.
- c. ALL MATERIALS STORED ONSITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND IF POSSIBLE UNDER A ROOF OR OTHER ENCLOSURE.
- d. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURE'S LABEL.
- e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
- f. A PRODUCT SHALL BE USED UP COMPLETELY BEFORE DISPOSING OF THE CONTAINER.
- g. MANUFACTURER'S RECOMMENDATION FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.
- h. THE CONTRACTOR SHALL CONDUCT A DAILY INSPECTION TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ONSITE.

B. HAZARDOUS MATERIAL POLLUTION PREVENTION PLAN:

- a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.
- b. ORIGINAL LABELS AND MATERIALS SAFETY DATA SHEETS MSDS SHALL BE RETAINED AND MADE AVAILABLE TO THE COUNTY ENGINEER UPON REQUEST.
- c. SURPLUS PRODUCTS SHALL BE DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR LOCAL AND STATE RECOMMENDED REGULATIONS.

C. ONSITE AND OFFSITE PRODUCTS SPECIFIC PLANS:

THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ONSITE:

- a. PETROLEUM BASED PRODUCTS: ALL ONSITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.
- b. FERTILIZERS: APPLY FERTILIZED USED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, WORK FERTILIZER INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE SHALL BE IN A COVERED SHED.
- c. PAINTS: SEAL AND STORE ALL CONTAINER WHEN NOT REQUIRED FOR USE. DO NOT DISCHARGE EXCESS PAINT TO THE ROADWAY DRAINAGE SYSTEM. DISPOSE PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTION OR STATE AND LOCAL REGULATIONS.
- d. CONCRETE TRUCKS: WASH OUT OR DISCHARGE CONCRETE TRUCK DRUM WASH WATER ONLY AT A DESIGNATED SITE. DO NOT DISCHARGE WATER IN ROADWAY DRAINAGE SYSTEM OR WATERS OF THE UNITED STATES. CONTACT DRINKING WATER BRANCH, DEPARTMENT OF HEALTH AT (808) 586-4258 TO RECEIVE PERMISSION TO DESIGNATE A DISPOSAL SITE. CLEAN DISPOSAL SITE AS REQUIRED OR AS REQUESTED BY THE OWNER'S REPRESENTATIVE.

D. SPILL CONTROL PLAN:

- a. POST A SPILL PREVENTION PLAN TO INCLUDE MEASURES TO PREVENT AND CLEAN UP EACH SPILLWAY.
- b. THE CONTRACTOR SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. DESIGNATE AT LEAST THREE SITE PERSONNEL WHO SHALL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS SHALL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. POST THE NAMES OF RESPONSIBLE SPILL PERSONAL IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.
- c. CLEARLY POST MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP. MAKE SITE PERSONNEL AWARE OF THE PROCEDURES AND THE LOCATION OF INFORMATION AND CLEANUP SUPPLIES.
- d. KEEP MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP IN THE MATERIAL STORAGE AREA ONSITE. CLEAN UP ALL SPILL IMMEDIATELY AFTER DISCOVERY.
- e. KEEP THE SPILL AREA WELL VENTILATED. PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH HAZARDOUS SUBSTANCE.
- f. REPORT SPILLS OF TOXIC HAZARDOUS MATERIAL TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

PAVEMENT AND TRENCH RESTORATION NOTES

- 1. PAVEMENT RESURFACING WORK SHALL INCLUDE 2-INCH THICKNESS OF EXISTING A.C. TO BE COLD PLANED AND CONSTRUCTION OF A MINIMUM OF 2-INCH OF NEW A.C. (STATE MIX IV) LAYER.
- 2. ALL EXISTING PAVEMENT STRIPING DISTURBED BY THIS PROJECT SHALL BE RESTORED. THE STRIPING MATERIALS SHALL BE THERMOPLASTIC TAPE OR THERMOPLASTIC EXTRUSION. PAINTING IS NOT ACCEPTABLE.

ADDITIONAL DOFAW NOTES

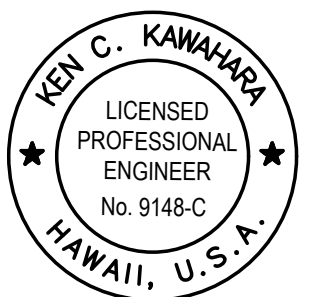
- 1. TAKE ALL MEASURES TO MINIMIZE DISTURBING OR DAMAGING EXISING NAVTIVE PLANT SPECIES DURING CONSTRUCTION. DOFAW WILL CONDUCT BIOLOGICAL SURVEY OF ENTIRE PROJECT AREA (STAGING AND CONSTRUCTION) PRIOR TO CONTRACTOR STARTING WORK.
- 2. PRIOR TO ENTERING THE JOB SITE, ALL EQUIPMENT AND FOOTWEAR SHALL BE WASHED WITH POTABLE WATER AND SPRAYED WITH 70% ALCOHOL OR FRESH 10% CLOROX SOLUTION TO PREVENT EXOTIC PLANTS AND SEEDS FROM BEING INTRODUCED TO THE JOB SITE/AREA.
- 3. HAWAIIAN HOARY BATS OR 'OPE'APE'A (LASIURUS CINEREUS SEMOTUS) IS KNOWN TO RESIDE IN THE VICINITY OF THE PROJECT AREA AND MAY ROOST IN NEARBY TREES. IF ANY SITE CLEARING IS REQUIRED THIS SHOULD BE TIMED TO AVOID DISTURBING THE BAT'S BIRTHING AND PUP REARING SEASON (JUNE 1 THROUGH SEPTEMBER 15). IF THIS CANNOT BE AVOIDED, WOODY PLANTS GREATER THAN 15 FEET (4.6 METERS) IN HEIGHT SHOULD NOT BE DISTURBED, REMOVED, OR TRIMMED WITHOUT CONSULTING DOFAW AND STATE'S CONSTRUCTION REPRESENTATIVE. BARBED WIRE IS NOT ALLOWED BECAUSE BAT MORTALITIES HAVE BEEN DOCUMENTED BY ENSNAREMENT DURING FLIGHT.
- 4. NIGHT WORK THAT REQUIRES OUTDOOR LIGHTING SHOULD BE AVOIDED DURING THE SEABIRD FLEDGING SEASON FROM SEPTEMBER 15 THROUGH DECEMBER 15. THIS IS THE PERIOD WHEN YOUNG SEABIRDS TAKE THEIR MAIDEN VOYAGE TO THE OPEN SEA. ARTIFICIAL LIGHTING CAN ADVERSELY IMPACT SEABIRDS BY CAUSING DISORIENTATION. THIS DISORIENTATION CAN RESULT IN COLLISION WITH MANMADE ARTIFACTS OR GROUNDING OF BIRDS. FOR NIGHT LIGHTING THAT MIGHT BE REQUIRED, DOFAW RECOMMENDS THAT ALL LIGHTS BE FULLY SHIELDED TO MINIMIZE IMPACTS.
- 5. THE ACTIVITIES ARE OCCURRING IN A STATE FOREST RESERVE AND THEREFORE ARE SUBJECT TO AND EXPECTED TO FOLLOW ALL PERTINENT CHAPTER 104 DOFAW-HAR THAT HAVE BEEN UPDATED IN JANUARY 2021.
<http://dlnr.hawaii.gov/dofaw/files/2013/09/HARChapter13-104.pdf>
- 6. STATE LANDS UNDER THE JURISDICTION OF DOFAW ARE OPEN TO PUBLIC HUNTING THROUGHOUT THE YEAR. PLEASE VIEW THE HUNTING RULES AND DAYS ON OUR AGENCY WEBSITE. BLAZE ORANGE SHALL BE WORN ON ALL LEGAL HUNTING DAYS.
<http://dlnr.hawaii.gov/recreation/hunting/kaui/>
- 7. IN THE EVENT ANY ARCHAEOLOGICAL SITES OR REMAINS SUCH AS BONES OR CHARCOAL DEPOSITS, HUMAN BURIALS, ROCK OR CORAL ALIGNMENTS, ROCK WALLS ARE ENCOUNTERED, CONTRACTOR SHALL STOP ALL ACTIVITY AND CONTACT STATE HISTORIC PRESERVATION DIVISION IN KAPOLEI (808) 692-8015 OR SHERI MANN (808) 729-0714 IMMEDIATELY.
- 8. REPORTING OF INAPPROPRIATE ACTIVITIES TO DOFAW AND/OR DOCARE IS ENCOURAGED. DOCARE HOTLINE (808) 643-DLNR

ADDITIONAL NOTES RELATING HAWAII EXPERIMENTAL TROPICAL FOREST (H.E.T.F. BIOSECURITY MEASURES (SUCH AS RAPID OHIA DEATH. (VERIFY WITH DOFAW ON APPLICABILTY))

WITH REFERENCE TO THE H.E.T.F. BIOSECURITY HANDOUT, (WHICH IS AVAILABLE FROM D.O.F.A.W. STAFF) COMPLY WITH THE FOLLOWING PARAPHRASED INSTRUCTIONS TO PREVENT THE INTRODUCTION AND SPREAD OF HARMFUL ORGANISMS INCLUDING, BUT NOT LIMITED TO WEEDS, INSECTS, AND INFECTED PLANTS.

- 1. INSPECT AND CLEAN ALL EQUIPMENT, GEAR, AND VEHICLES (PERSONAL AND PROJECT) THAT ENTER AND EXIT THE JOB SITE.
- 2. ENSURE THAT ALL GEAR EQUIPMENT AND VEHICLES ARE FREE OF ANY PLANT, ANIMAL, OR EARTHEN MATERIALS. ALL EQUIPMENT, GEAR, AND VEHICLES SHALL BE INSPECTED, CLEANED AND SANITIZED WITH 70% ALCOHOL OR 10% CLOROX SOLUTION BEFORE ENTERING THE JOB SITE, AND BEFORE LEAVING ANY WEED INFECTED/CONTAMINATED AREA TO PREVENT TRACKING IN HARMFUL ORGANISMS (E.G.: WEEDS, INSECTS, PESTS) AND PREVENT SPREAD TO PRISTINE AND HEALTHY FOREST AREAS. EQUIPMENT TO INSPECT AND CLEAN INCLUDE BUT IS NOT LIMITED TO:
 - a. CINDER ARE CLOTHES & FOOTWEAR (TREADS, LACES, BOOT TONGUES), SOCKS, PANT LEGS, POCKETS, JACKETS, RAIN GEAR (POCKETS AND CUFFS).
 - b. EQUIPMENT & SUPPLIES-TOOLS, TOOL BAGS, BACPACKS & BAGS (FOLDS, POCKETS, VELCRO), WOOD AND BUILDING MATERIALS, FENCING MATERIALS, BOTTOMS OF PLASTIC BUCKETS, CARDBOARD BOXES (ROACHES & ANTS), OPEN FOOD AND WATER CONTAINERS, TENTS, HAMMOCKS, TARPS, HELICOPTER SLING NETS, CHAINSAW BLADES.
 - c. VEHICLES - THE INSIDE OF THE VEHICLES SHOULD BE VACUUMED AND THE TRUCK BEDS SWEEPED OUT REGULARLY, ESPECIALLY IF USED OFF-ROAD. CLEAN PLACES SUCH AS THE INSIDE LIP OF BUMPERS, SEATS, FLOORS, DASHBOARDS, DOOR JAMBS, TIRES (ESPECIALLY TIRE TREADS), AND THE UNDERCARRIAGE.
 - d. HEAVY EQUIPMENT, TRUCKS, ALL TYPES OF EARTHMOVING CONSTRUCTION EQUIPMENT AND GENERAL CONSTRUCTION EQUIPMENT AND SUPPLIES.
 - e. OTHER- ENSURE SOIL AND STERILE AND FREE OF INSECTS, WEEDS, AND PATHOGENS. ANYTHING SUSPICIOUS SHOULD NOT BE TAKEN ONTO THE JOB SITE.
- 3. ON A DAILY BASIS, PACK AND REMOVE ALL TRASH, INCLUDING ANY DISCARDED FOOD, FROM THE JOB SITE TO PREVENT NEGATIVELY AFFECTING THE FLORA AND FAUNA AT THE FIELD SITE. (*DISCARDED FOOD MAY CONTAIN UNSEEN INSECTS, FUNGUS, BACTERIA, AND PARASITES; AND IS AN ATTRACTANT FOR INVASIVE INSECTS).
- 4. FOLLOW METHODS OF CLEANING SPECIFIED IN H.E.T.F. BIOSECURITY HANDOUT. SPECIFIED METHODS OF CLEANING INCLUDE:
 - a. WATER & HOSE, BRUSH, TWEEZERS, CLEAN RAG, KNIFE EDGE, BLEACH RINSE AND/OR INSECTICIDE.
 - b. CLEANING SHALL BE PERFORMED AWAY FROM THE FOREST WITH A NEARBY RECEPTACLE FOR DISPOSAL.
 - c. LAUNDERING OF WASHABLE ITEMS SHALL BE PERFORMED AFTER EACH TRIP.
 - d. IF ITEMS CANNOT BE CLEANED, THEY CANNOT BROUGHT INTO THE FOREST.
 - e. IF CONTAMINATED SUPPLIES ARE DISCOVERED, THEY MUST BE IMMEDIATELY REMOVED AND PROPERLY DISPOSED, AWAY FROM THE H.E.T.F.
- 5. CLEAN AND DISINFECT EQUIPMENT PRIOR TO MOBILIZATION TO JOB SITE.
- 6. IN THE EVENT THAT INFECTED OHIA TREES ARE FOUND AT THE FIELD SITE, THE CONTRACTOR SHALL BE INFORMED AND AT THE DIRECTION OF DOFAW TAKE MEASURES TO PREVENT THE SPREAD OF THE CERATOCYSTIS INFECTION OF OHIA TREES.
 - a. MEASURES INCLUDE AND ARE NOT LIMITED TO:
 - i. CONTACTING MAPUANA O'SULLIVAN 808-346-2338 OR SHERI MANN 808-729-0714 REGARDING THE LOCATION OF THE INFECTED OHIA TREES AND INCLUDING DIGITAL PICTURES OF THE CROWN OF THE SUSPECTED INFECTED TREE AND PLACES ON THE WOOD WITH CHARACTERISTIC STAINING OF THE INFECTION
 - ii. DO NOT TRANSPORT ANY OHIA WOOD.
 - iii. FOLLOW THE REQUIRED H.E.T.F. BIOSECURITY MEASURES (AS NOTED IN THE ABOVE ITEMS 1-5)

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		QUEENSLAND LOOP ROAD LOW WATER CROSSINGS			
CONSTRUCTION NOTES 02					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: AUG 2021		
CHECKED: KCK			SCALE: AS SHOWN		
APPROVED:			DRAWING NO.		
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION			C-02		
CHIEF ENGINEER		DATE			

TRUE NORTH
SCALE: 1" = 10'

NOTES:

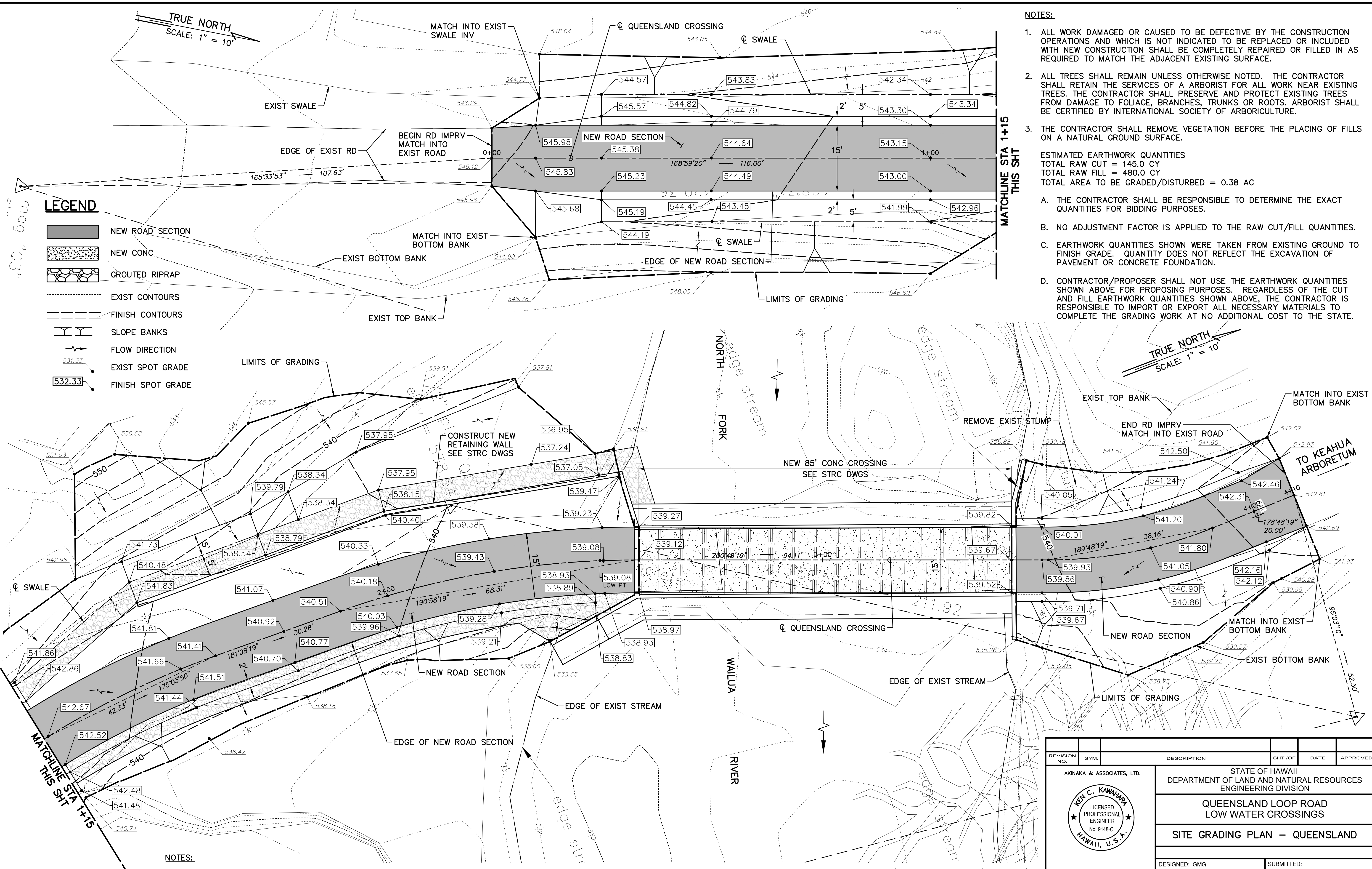
1. ALL WORK DAMAGED OR CAUSED TO BE DEFECTIVE BY THE CONSTRUCTION OPERATIONS AND WHICH IS NOT INDICATED TO BE REPLACED OR INCLUDED WITH NEW CONSTRUCTION SHALL BE COMPLETELY REPAIRED OR FILLED IN AS REQUIRED TO MATCH THE ADJACENT EXISTING SURFACE.
2. ALL TREES SHALL REMAIN UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL RETAIN THE SERVICES OF AN ARBORIST FOR ALL WORK NEAR EXISTING TREES. THE CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREES FROM DAMAGE TO FOLIAGE, BRANCHES, TRUNKS OR ROOTS. ARBORIST SHALL BE CERTIFIED BY INTERNATIONAL SOCIETY OF ARBORICULTURE.
3. THE CONTRACTOR SHALL REMOVE VEGETATION BEFORE THE PLACING OF FILLS ON A NATURAL GROUND SURFACE.

ESTIMATED EARTHWORK QUANTITIES
 TOTAL RAW CUT = 145.0 CY
 TOTAL RAW FILL = 480.0 CY
 TOTAL AREA TO BE GRADED/DISTURBED = 0.38 AC

- A. THE CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE THE EXACT QUANTITIES FOR BIDDING PURPOSES.
- B. NO ADJUSTMENT FACTOR IS APPLIED TO THE RAW CUT/FILL QUANTITIES.
- C. EARTHWORK QUANTITIES SHOWN WERE TAKEN FROM EXISTING GROUND TO FINISH GRADE. QUANTITY DOES NOT REFLECT THE EXCAVATION OF PAVEMENT OR CONCRETE FOUNDATION.
- D. CONTRACTOR/PROPOSER SHALL NOT USE THE EARTHWORK QUANTITIES SHOWN ABOVE FOR PROPOSING PURPOSES. REGARDLESS OF THE CUT AND FILL EARTHWORK QUANTITIES SHOWN ABOVE, THE CONTRACTOR IS RESPONSIBLE TO IMPORT OR EXPORT ALL NECESSARY MATERIALS TO COMPLETE THE GRADING WORK AT NO ADDITIONAL COST TO THE STATE.

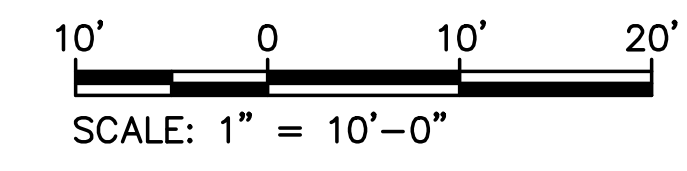
LEGEND

- NEW ROAD SECTION
- NEW CONC
- GROUDED RIPRAP
- EXIST CONTOURS
- FINISH CONTOURS
- SLOPE BANKS
- FLOW DIRECTION
- EXIST SPOT GRADE
- FINISH SPOT GRADE



- NOTES:
1. FOR ROAD SECTIONS, SEE SHT C-05
 2. FOR AC PAVEMENT SECTIONS, SEE SHT C-06
 3. GRADES AT INTERVALS ARE EVERY 25 FT ALONG ROAD ϕ BEGINNING AT STA 0+00

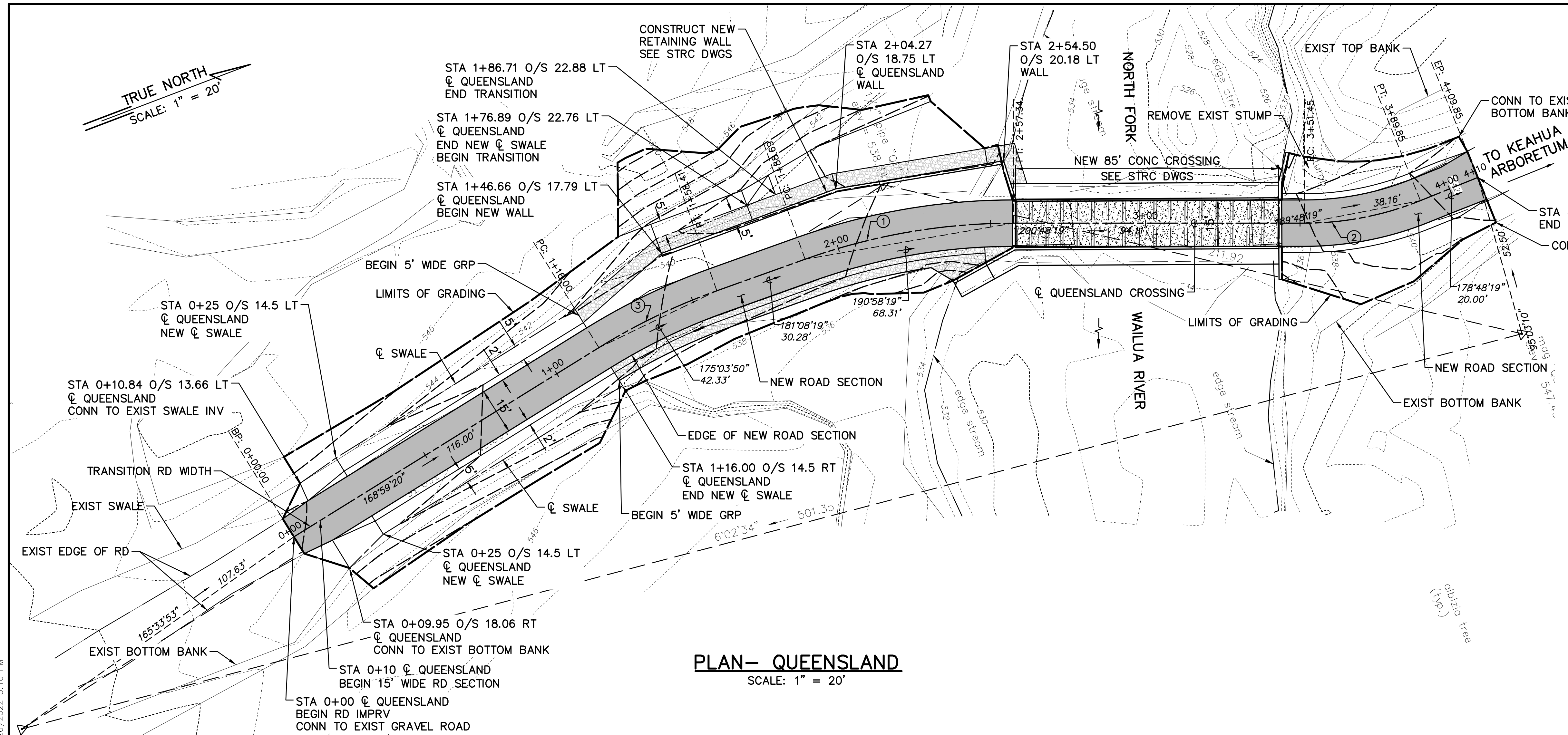
SITE GRADING PLAN - QUEENSLAND
SCALE: 1" = 10'



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD.					
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
QUEENSLAND LOOP ROAD LOW WATER CROSSINGS					
SITE GRADING PLAN - QUEENSLAND					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/ARK			DATE: AUG 2021		
CHECKED: KCK			SCALE: AS SHOWN		
APPROVED:			DRAWING NO.		
CHIEF ENGINEER			DATE		
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION					
C-03					

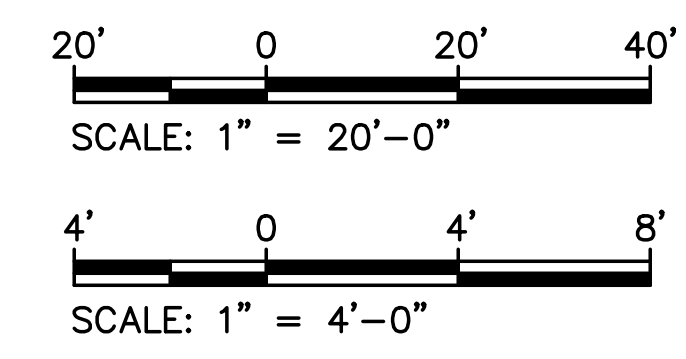
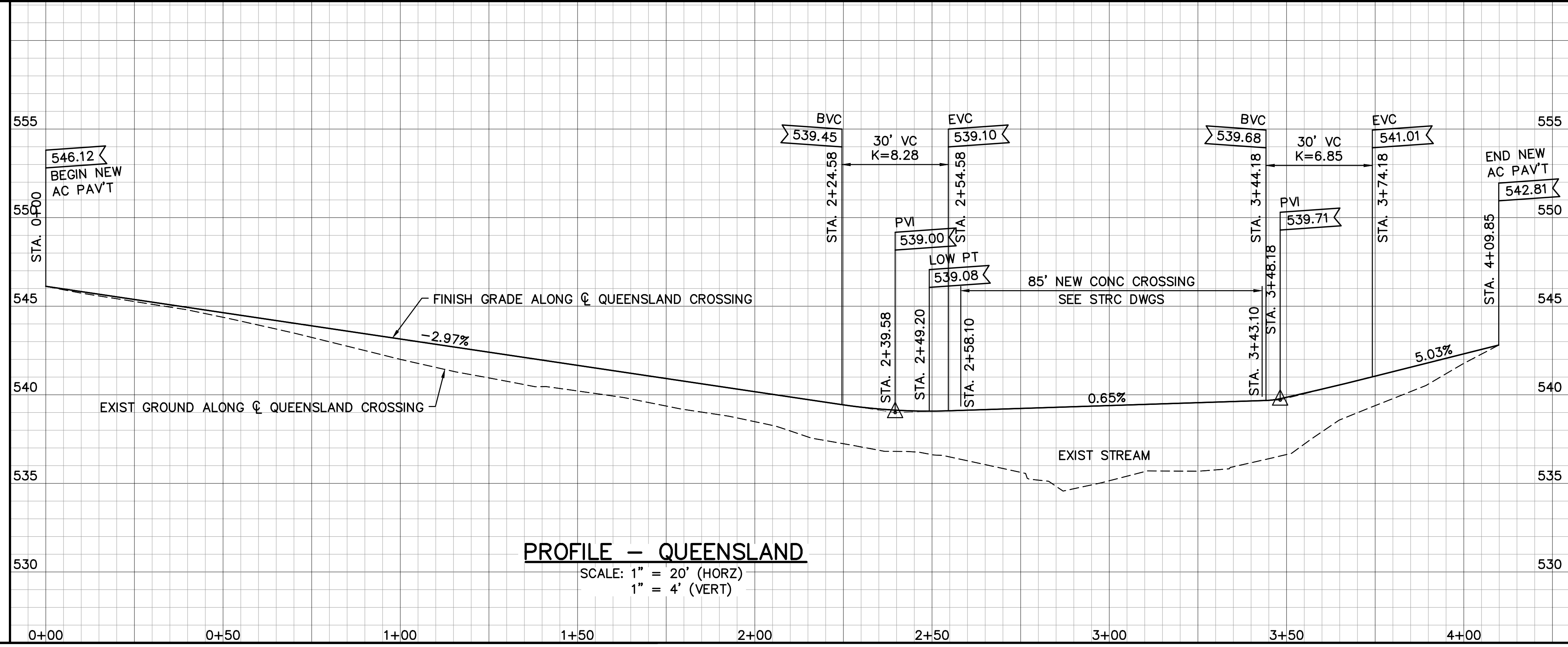
PATH: G:\KAI2002 LIHUE KOLOA LOW WATER CROSSINGS\300 DSRN\310 PLANS
 FILE: KAI2002 - GRADING PLAN 03 (QUEENSLAND).DWG
 BEGIN: 30-Dec-21
 PM: CLJ
 CURRENT OPER: GMG 12/30/2021 9:37 AM
 LAST SAVED BY: GMG REVISED: 4/26/2022 7:07 AM

CURVE DATA						
CURVE	Δ	Δ/2	R	T	C	Lc
1	19°40'00"	9°50'00"	200.00	34.67	68.31	68.65
2	22°00'00"	11°00'00"	100.00	19.44	38.16	38.40
3	12°08'59"	6°04'30"	200.00	21.29	42.33	42.41



LEGEND

- NEW ROAD SECTION
- NEW CONC
- GRouted RIPRAP
- EXIST. CONTOURS
- FINISH CONTOURS
- SLOPE BANKS



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED

AKINAKA & ASSOCIATES, LTD.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

QUEENSLAND LOOP ROAD
LOW WATER CROSSINGS

PLAN AND PROFILE -
QUEENSLAND

DESIGNED: GMG
DRAWN: KJM/AKK
CHECKED: KCK
APPROVED: _____
CHIEF ENGINEER

SUBMITTED: _____
DATE: AUG 2021
SCALE: AS SHOWN
DATE: _____

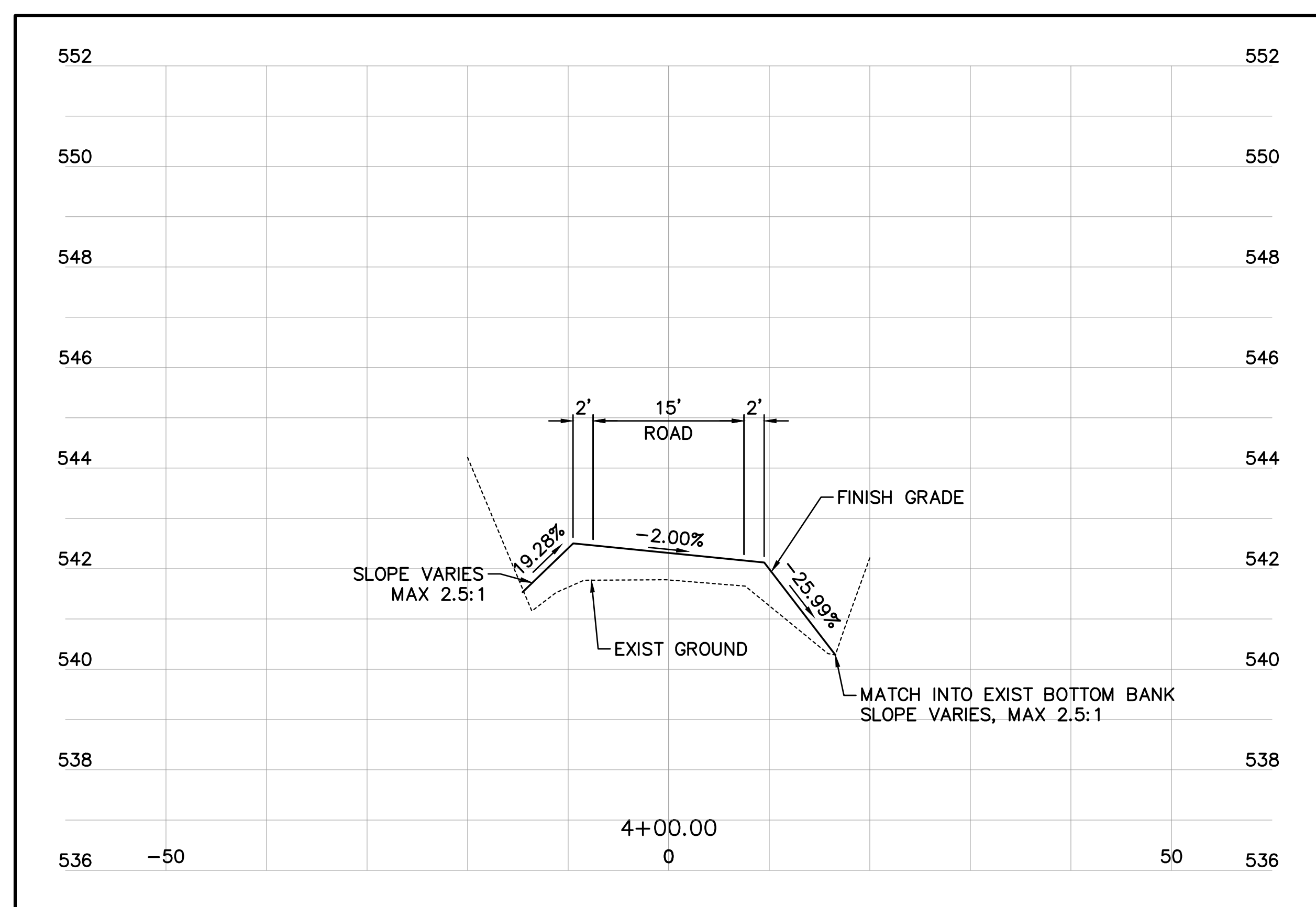
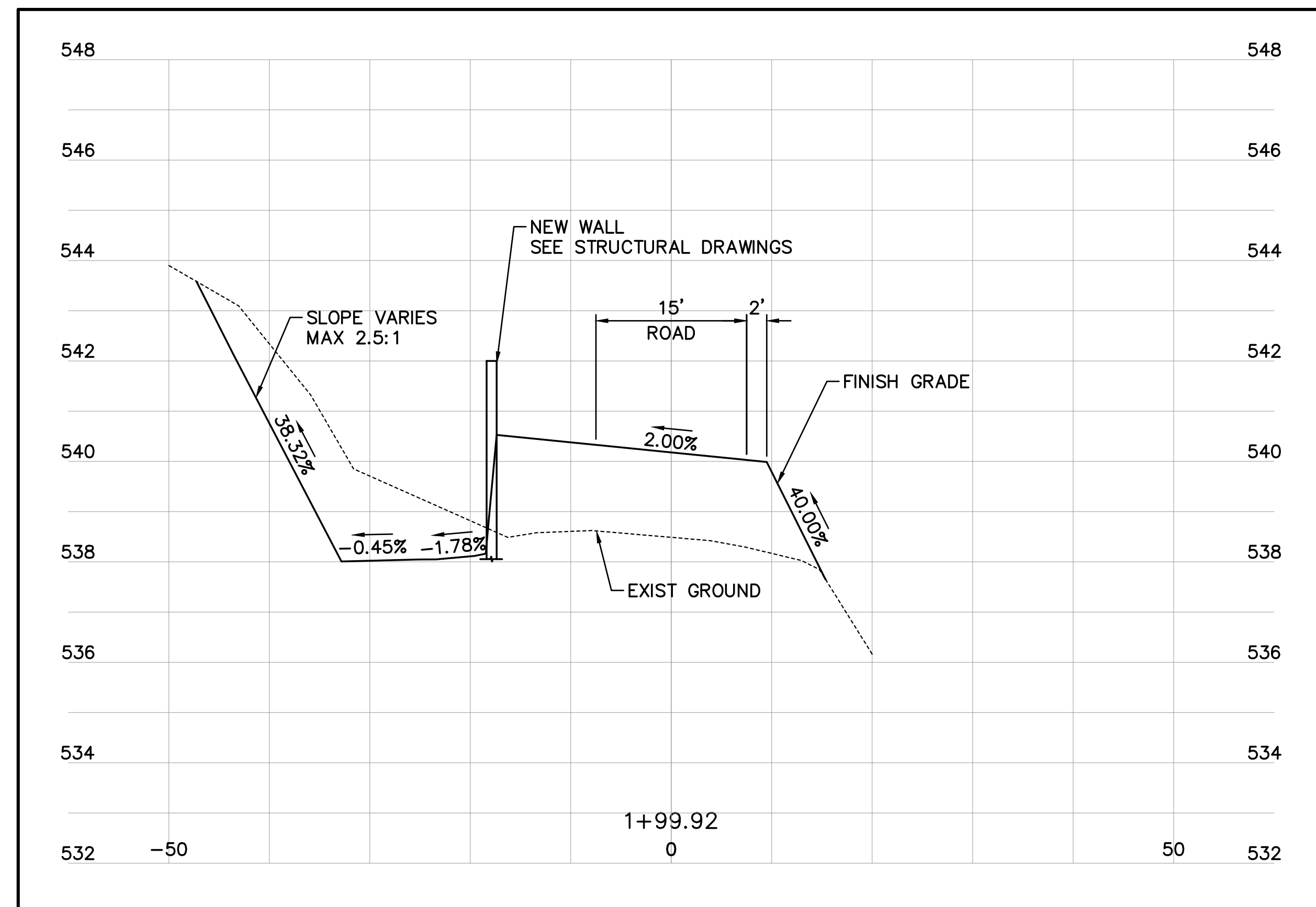
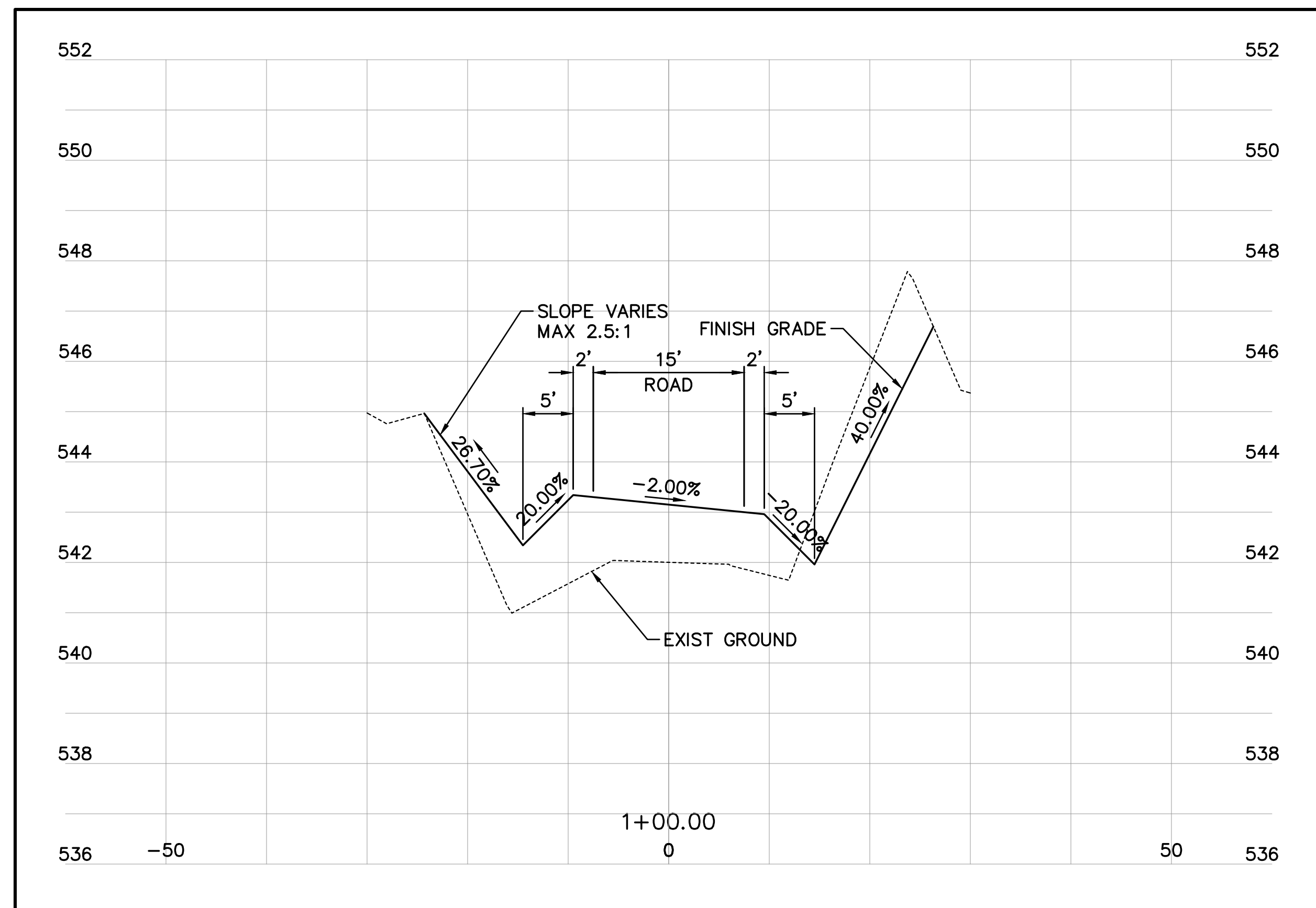
EXPIRATION DATE OF THE LICENSE 4/30/2024
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

DRAWING NO. C-04

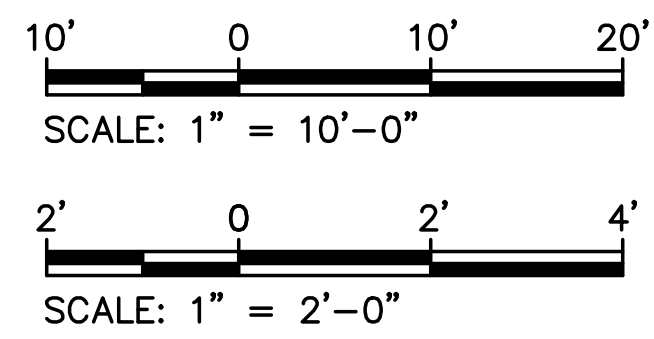
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LAST SAVED BY: GMG REVISED: 4/26/2022 3:10 PM

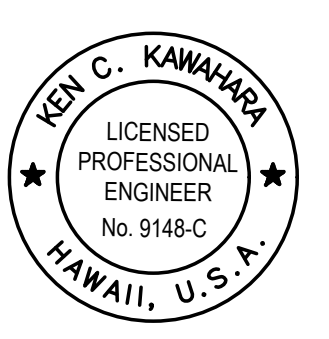
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FILE: KAI2002 - SITE PLAN 03 (QUEENSLAND).DWG
BEGIN: 2-AUG-21

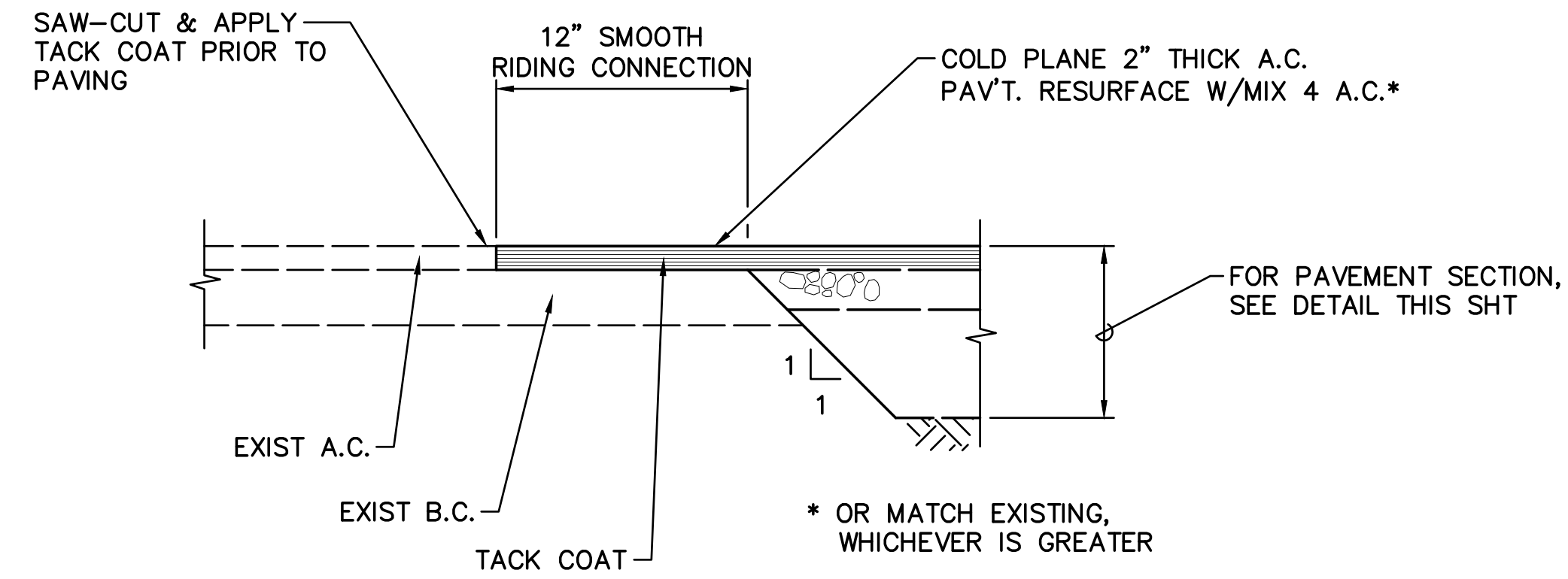
PATH: G:\KAIZ002 LIHUE KOLOA LOW WATER CROSSINGS\300 DSRN\310 PLANS
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 BEGIN: 7-Jan-22
 PM: CLJ
 CURRENT OPER: GMG 1/7/2022 2:26 PM
 LAST SAVED BY: GMG REVISED: 4/26/2022 12:52 PM



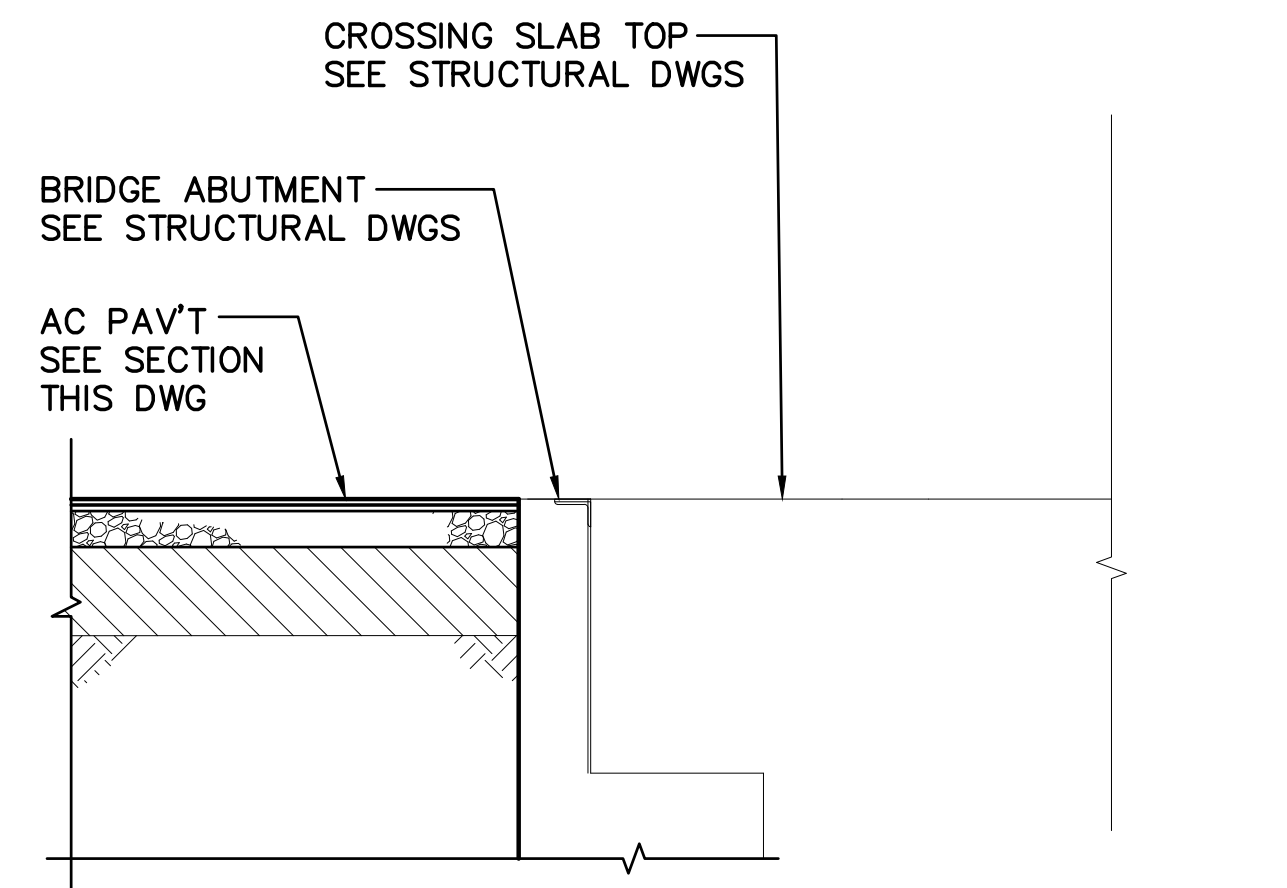
NOTES:
 FOR AC PAVEMENT SECTIONS, SEE SHT C-06



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD.  LICENSED PROFESSIONAL ENGINEER					
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
QUEENSLAND LOOP ROAD LOW WATER CROSSINGS					
ROADWAY SECTIONS 01 - QUEENSLAND					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: AUG 2021		
CHECKED: KCK			SCALE: AS SHOWN		
APPROVED:			DRAWING NO.		
CHIEF ENGINEER			C-05		

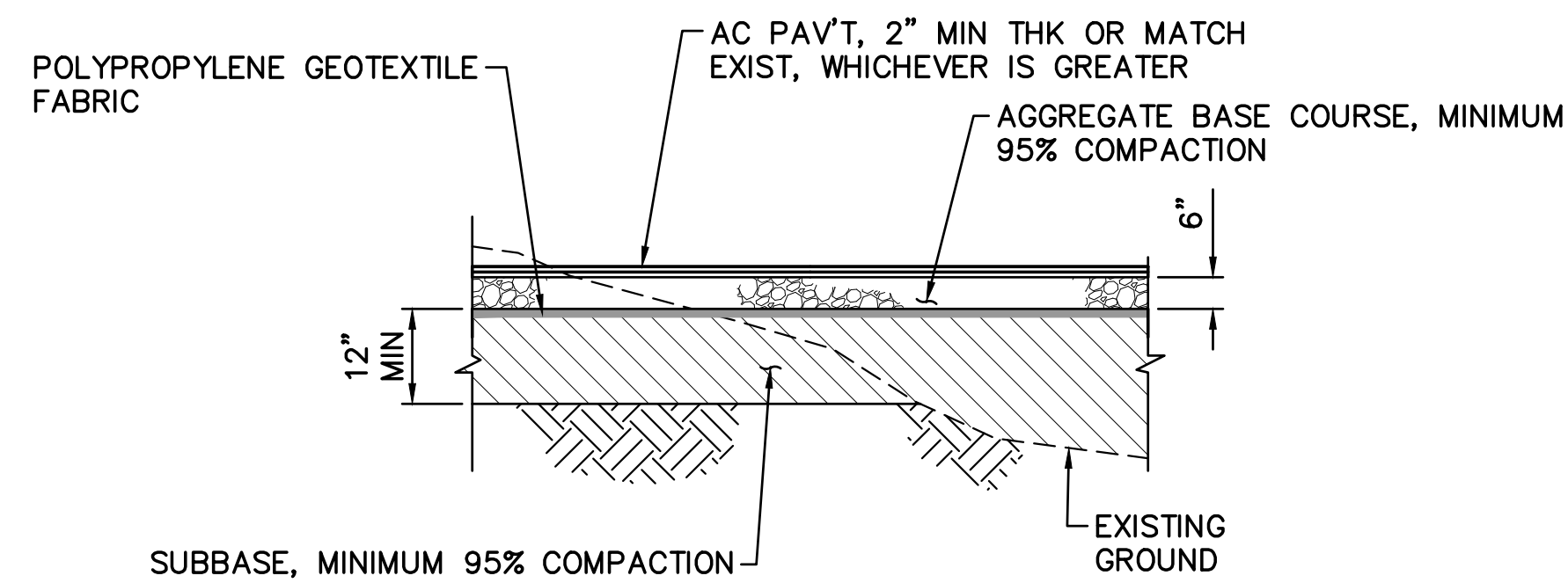


1 **SMOOTH RIDING CONNECTION DETAIL**
 C-06 NOT TO SCALE



AT STA. 2+11.47
 NOT TO SCALE

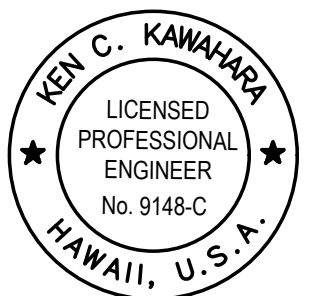
2 **BRIDGE PAVEMENT TRANSITION DETAILS**
 C-06 SCALE AS SHOWN

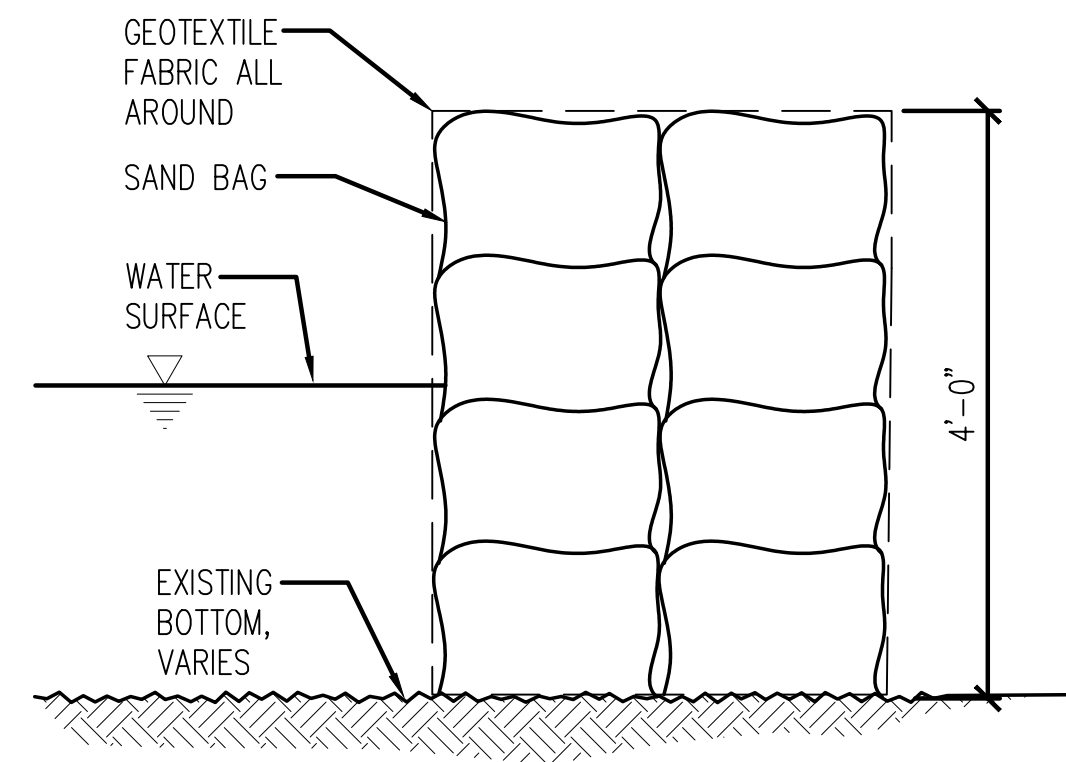
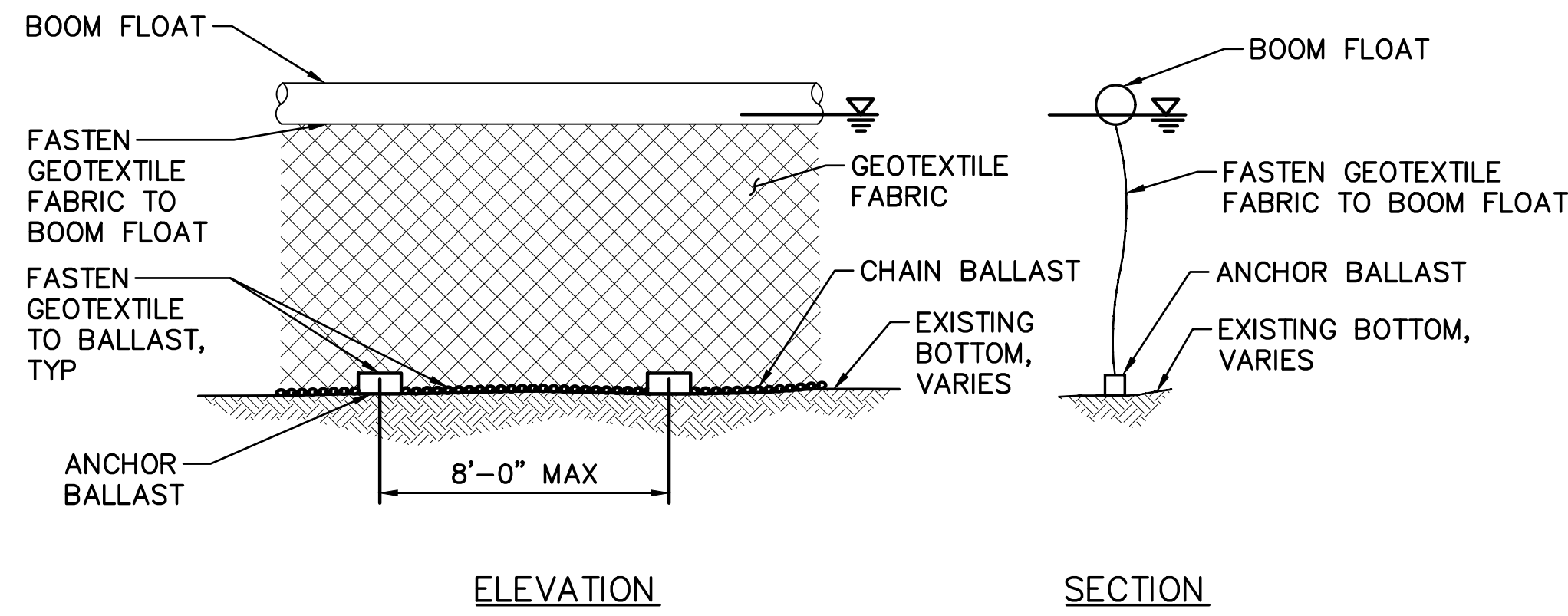


3 **TYPICAL PAVEMENT SECTION**
 C-06 NOT TO SCALE

PM: CLJ
 CURRENT OPER: GMG 1/7/2022 2:42 PM
 LAST SAVED BY: GMG REVISED: 4/26/2022 2:44 PM

PATH: G:\KA2002 LIHUE KOLOA LOW WATER CROSSINGS\300 DSRN\310 PLANS
 FILE: KA2002 - ROADWAY DETAILS 01.DWG
 BEGIN: 7-Jan-22

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD.					
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
QUEENSLAND LOOP ROAD LOW WATER CROSSINGS					
ROADWAY DETAILS 01 - QUEENSLAND					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: AUG 2021		
CHECKED: KCK			SCALE: AS SHOWN		
APPROVED:			DRAWING NO.		
			C-06		
<small>EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION</small>			<small>CHIEF ENGINEER</small> _____ <small>DATE</small> _____		



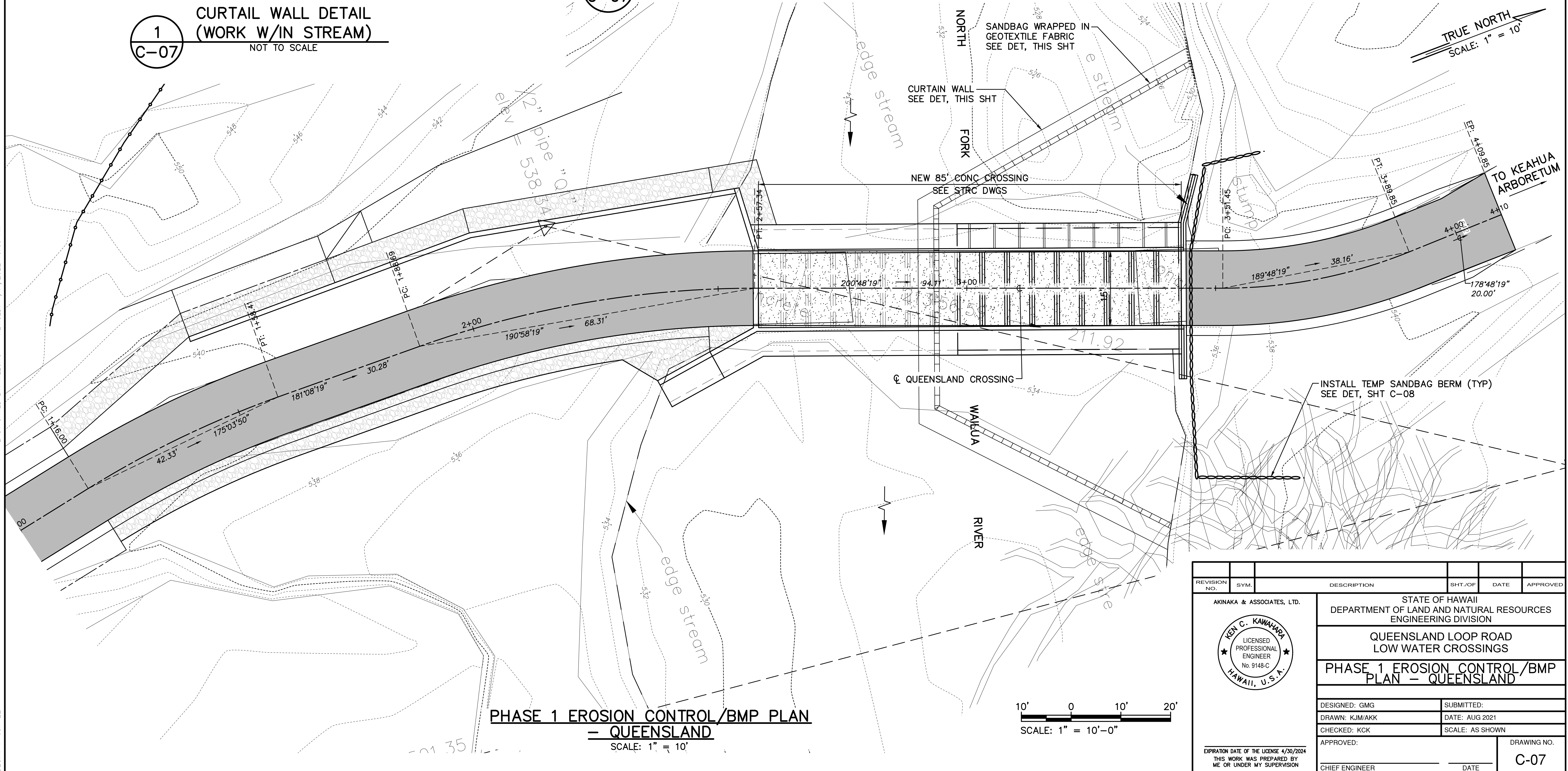
- NOTES:**
- IMPLEMENTATION OF BEST MANAGEMENT PRACTICES (BMPs) INCLUDES CONSTRUCTION OF WORK SCAFFOLDING/PLATFORMS THAT WILL PROTECT STREAM BELOW FROM FALLING DEBRIS DURING CONSTRUCTION. COST OF MAINTENANCE OF BMPs AND OTHER ASSOCIATED WORK SHALL BE INCLUDED IN THE ENVIRONMENTAL POLLUTION CONTROL BID ITEM.
 - ANY REMOVAL OF ROCK OR MATERIAL TO FACILITATE THE PLACEMENT OF SANDBAGS SHALL BE COMPLETELY REMOVED FROM WAILUA RIVER.

LEGEND

	NEW ROAD SECTION
	NEW CONC
	GRouted RIPRAP
	EXIST. CONTOURS
	FINISH CONTOURS
	SLOPE BANKS
	SILT FENCE
	SANDBAG BERM

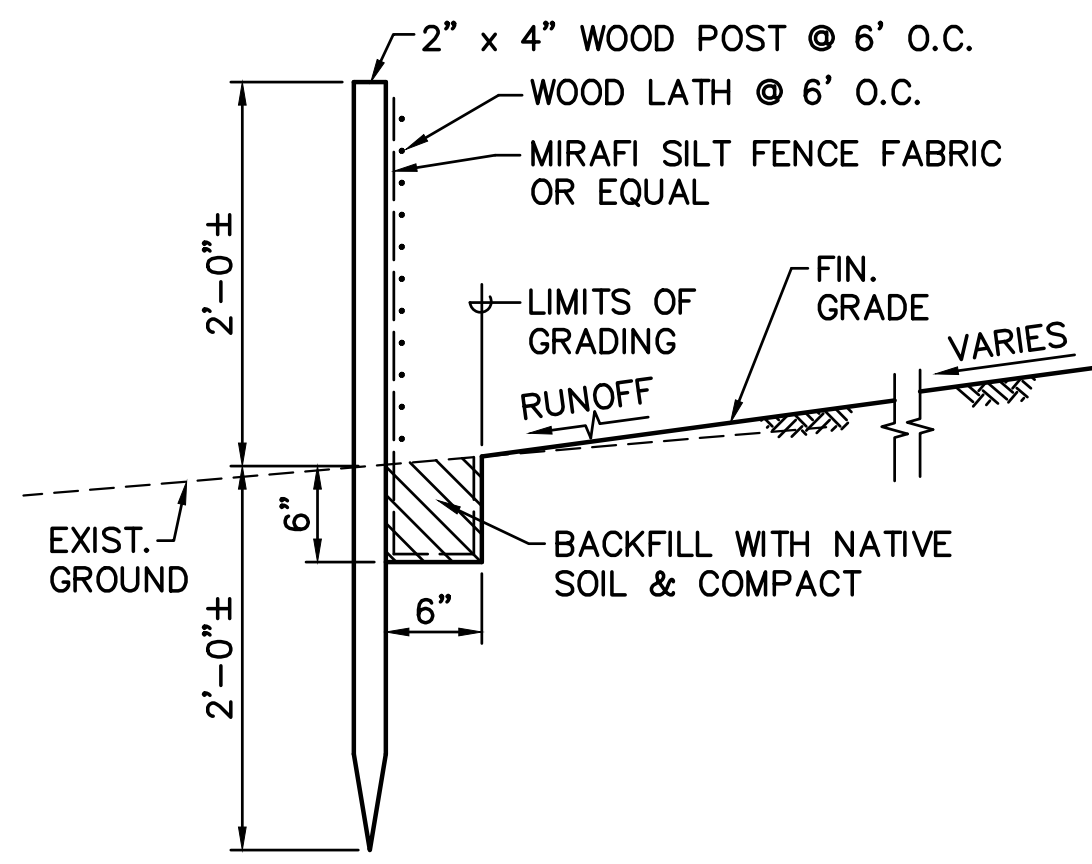
1
C-07
CURTAIN WALL DETAIL (WORK W/IN STREAM)
NOT TO SCALE

2
C-07
SANDBAG WRAPPING IN GEOTEXTILE FABRIC DETAIL (WORK W/IN STREAM)
NOT TO SCALE

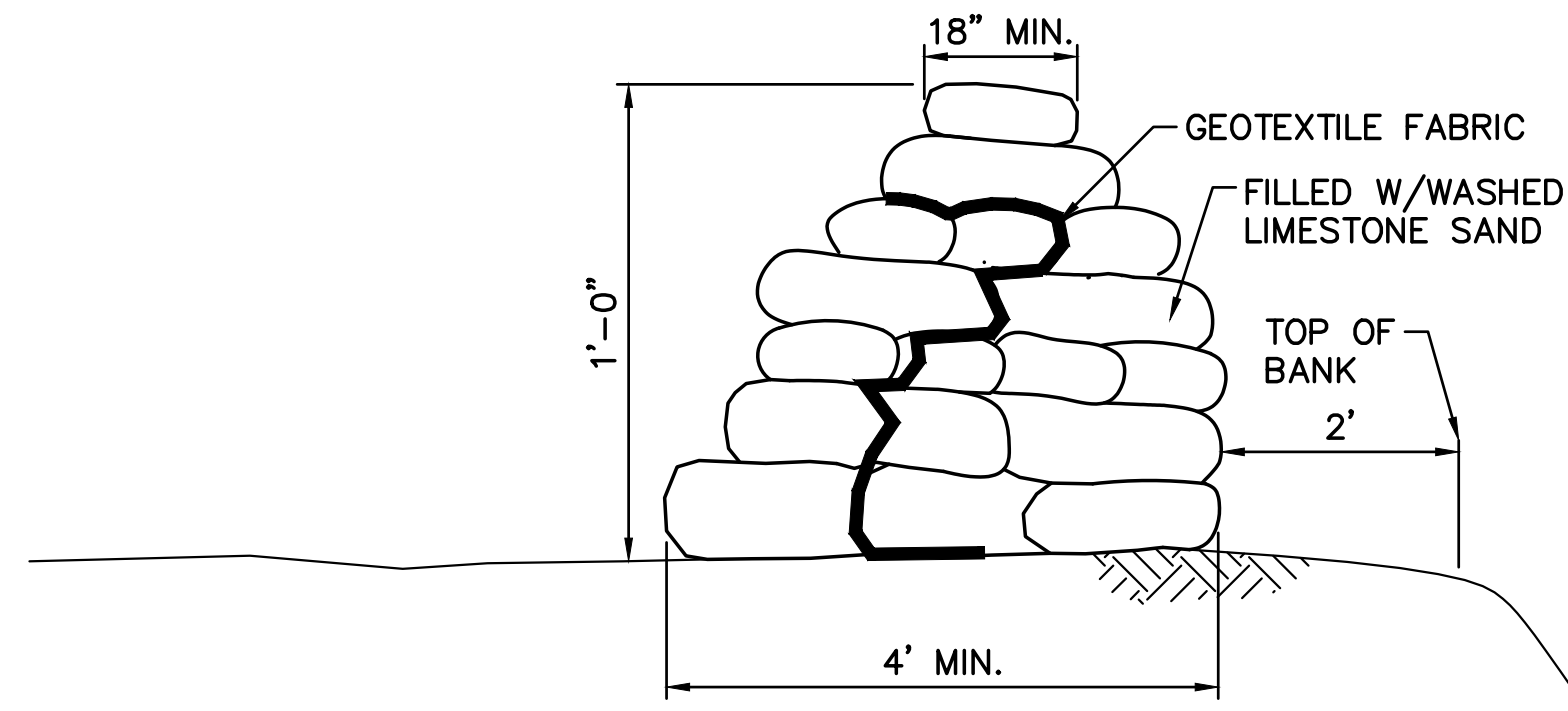


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LAST SAVED BY: MILEUNG
1/7/2022 10:06 AM
REVISED: 4/11/2022 10:09 AM
G:\KAI2002 LIHUE KOLOA LOW WATER CROSSINGS\300 DSGN\310 PLANS
FILE: KAI2002 - EROSION CONTROL PLAN 03 (QUEENSLAND).DWG
BEGIN: 7-Jun-22

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD.					
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
QUEENSLAND LOOP ROAD LOW WATER CROSSINGS					
PHASE 1 EROSION CONTROL/BMP PLAN - QUEENSLAND					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: AUG 2021		
CHECKED: KCK			SCALE: AS SHOWN		
APPROVED:			DRAWING NO.		
CHIEF ENGINEER			DATE		
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION					
C-07					



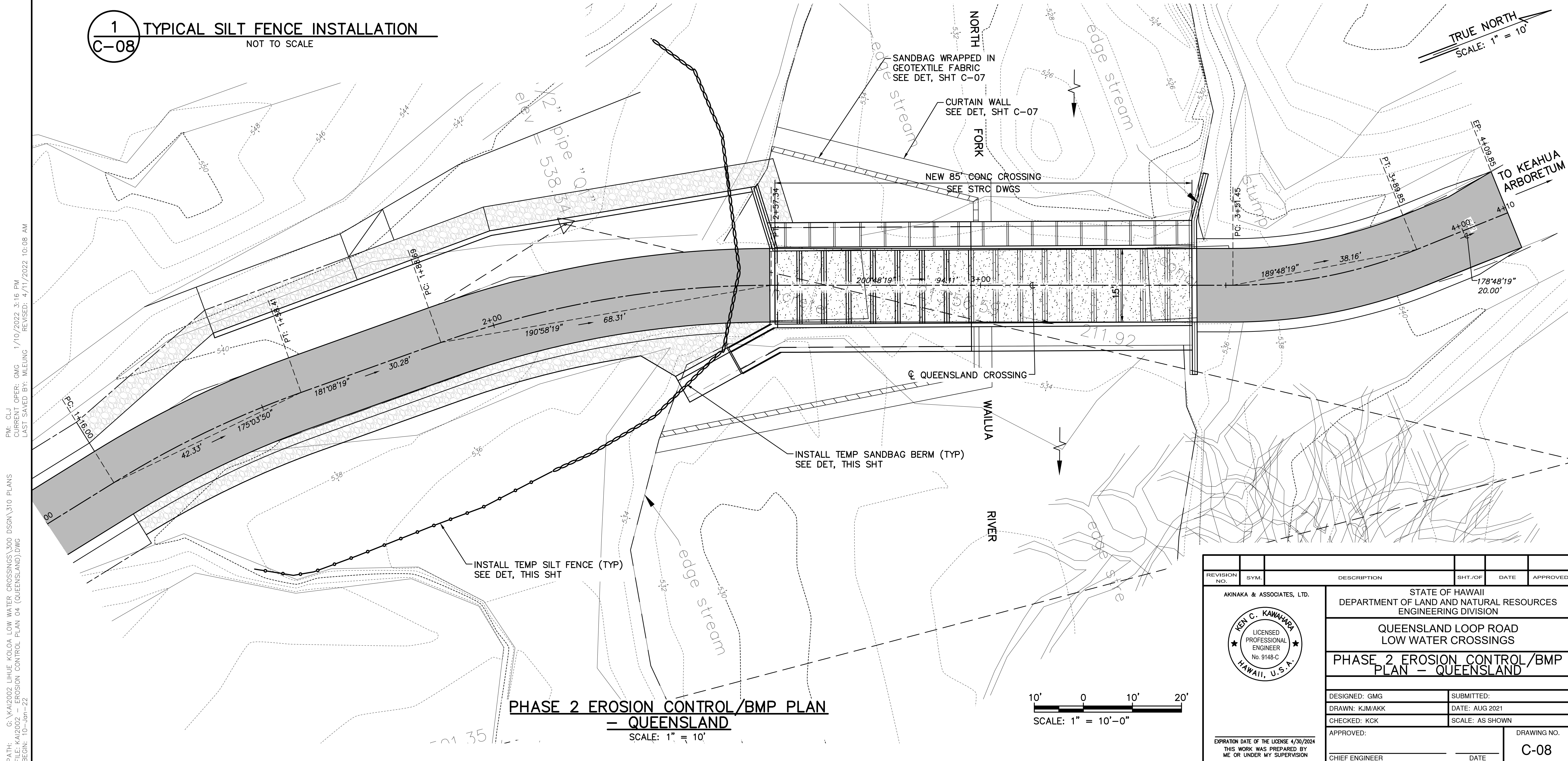
1
C-08 **TYPICAL SILT FENCE INSTALLATION**
NOT TO SCALE



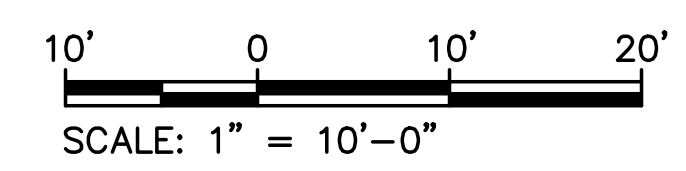
2
C-08 **TEMPORARY SANDBAG BERM**
NOT TO SCALE

TYPICAL DIMENSIONS PER SANDBAG
WIDTH: 16" TO 18"
LENGTH: 24" TO 30"
THICKNESS: 6" TO 8"
WEIGHT: 90 TO 125 POUNDS

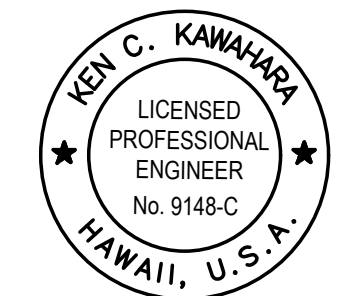
- LEGEND**
- NEW ROAD SECTION
 - NEW CONC
 - GROUTED RIPRAP
 - EXIST. CONTOURS
 - FINISH CONTOURS
 - SLOPE BANKS
 - SILT FENCE
 - SANDBAG BERM



PHASE 2 EROSION CONTROL/BMP PLAN
— QUEENSLAND
SCALE: 1" = 10'



PATH: G:\KAI2002 LIHUE KOLOA LOW WATER CROSSINGS\300 DSGN\310 PLANS
 FILE: KAI2002 - EROSION CONTROL PLAN 04 (QUEENSLAND).DWG
 BEGIN: 10-09-22
 PM: CLJ
 CURRENT OPER: GMG
 LAST SAVED BY: MILEUNG
 1/10/2022 3:16 PM
 REVISED: 4/11/2022 10:08 AM

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD.  STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION QUEENSLAND LOOP ROAD LOW WATER CROSSINGS PHASE 2 EROSION CONTROL/BMP PLAN - QUEENSLAND					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: AUG 2021		
CHECKED: KCK			SCALE: AS SHOWN		
APPROVED:			DRAWING NO.		
CHIEF ENGINEER			DATE		
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION			C-08		

GENERAL:

- A. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION, 9TH EDITION, 2020 INCLUDING ITS SUBSEQUENT INTERIM SPECIFICATIONS, AND THE HAWAII STANDARD SPECIFICATIONS FOR BRIDGE AND ROAD CONSTRUCTION, 2005 AS MODIFIED BY THE STATE OF HAWAII DEPARTMENT OF TRANSPORTATION.
- B. THE CONTRACTOR SHALL COMPARE THE CIVIL AND STRUCTURAL DRAWINGS WITH EACH OTHER AND REPORT IN WRITING TO THE ENGINEER, INCONSISTENCIES OR OMISSIONS.
- C. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS WITH THE DRAWINGS BEFORE COMMENCING THE WORK. REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES OR OMISSIONS.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR METHODS OF CONSTRUCTION, WORKMANSHIP AND JOB SAFETY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AND BRACING AS REQUIRED FOR STABILITY OF STRUCTURAL MEMBERS AND SYSTEMS.
- E. DETAILS NOTED AS TYPICAL ON STRUCTURAL DRAWINGS SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE.
- F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.
- G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE ADJACENT PROPERTIES, STRUCTURES, STREETS, AND UTILITIES DURING THE CONSTRUCTION PERIOD. ANY DAMAGE OR DETERIORATED PROPERTY SHALL BE RESTORED TO THE SAME OR BETTER CONDITION AT NO COST TO THE STATE.

DESIGN CRITERIA:

- A. DEAD LOAD
- WEIGHT OF ALL COMPONENTS OF THE STRUCTURES, APPURTENANCES ATTACHED THERETO, AND EARTH COVERS.
- B. LIVE LOAD
- HL-93 TRUCK
- C. STATIC LATERAL EARTH PRESSURE
- ACTIVE CONDITION, ABOVE GROUNDWATER ----- = 35 PCF

FOUNDATION:

- A. FOUNDATION DESIGN IS BASED UPON GEOTECHNICAL INVESTIGATIONS BY HART CROWSER AND DATED AUGUST 19, 2021.
- B. CONTRACTOR SHALL PROVIDE FOR DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING, AND SHORING NECESSARY FOR PERSONNEL SAFETY AND TO PRESERVE EXCAVATIONS AND EARTH BANKS, AND ADJACENT STRUCTURES AND PROPERTY FOR DAMAGE.
- C. EXCAVATION BOUNDARIES AND GRADE ELEVATIONS FOR FOOTING SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING THE CONCRETE AND REINFORCING.
- D. BACKFILL BEHIND THE RETAINING STRUCTURES (ABOVE THE GROUNDWATER LEVEL) MAY CONSIST OF THE ON-SITE SOILS OR SELECT GRANULAR FILLS (TYPE A STRUCTURE BACKFILL). BACKFILL SHALL BE PLACED IN UNIFORM LIFTS OF NO MORE THAN 8 INCHES IN LOOSE THICKNESS AND UNIFORMLY COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION. BECAUSE SHALLOW GROUNDWATER CONDITIONS ARE ANTICIPATED, BACKFILL MATERIALS BELOW THE GROUNDWATER LEVEL SHOULD CONSIST OF FREE-DRAINING GRANULAR MATERIALS, SUCH AS AASHTO M43, NO 67 GRADATION (ASTM C33, NO 67 GRADATION), WRAPPED ON ALL SIDES WITH NON-WOVEN FILTER FABRIC (MIRAFI 180N OR EQUIVALENT). THE FREE-DRAINING GRANULAR MATERIALS SHOULD BE USED UP TO A LEVEL OF ABOUT 12 INCHES ABOVE THE GROUNDWATER LEVEL TO FACILITATE COMPACTION OF THE BACKFILL MATERIALS.

CONCRETE:

- A. CONCRETE SHALL BE NORMAL WEIGHT HARD ROCK CONCRETE AND SHALL HAVE 4000 PSI MINIMUM 28-DAY COMPRESSIVE STRENGTHS.
- ALL CONCRETE SHALL HAVE MAXIMUM W/C RATIO OF 0.45 EXCEPT FOR CLASS "A" WHICH SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS.
- B. TETRAGUARD AS20 SHRINKAGE REDUCING ADMIXTURE, ECLIPSE PLUS SHRINKAGE REDUCING ADMIXTURE, OR AN APPROVED EQUAL, SHALL BE INCLUDED IN THE CONCRETE MIX FOR THE CONCRETE TOPPING AND BRIDGE RAILING. THE REQUIRED DOSAGE SHALL BE 128 OUNCES PER CUBIC YARD OF CONCRETE OR AS RECOMMENDED BY THE MANUFACTURER. ADDITION OF SHRINKAGE REDUCING ADMIXTURE SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
- C. A CORROSION INHIBITING ADMIXTURE SHALL BE INCLUDED IN THE CONCRETE MIX FOR ALL CONCRETE. THE CORROSION INHIBITING ADMIXTURE SHALL CONTAIN A MINIMUM OF 30% CALCIUM NITRATE BY MASS AND SHALL BE ADDED AT A DOSAGE RATE OF 4.0 GALLONS PER CUBIC YARD OF CONCRETE OR AS RECOMMENDED BY THE MANUFACTURER. THE ADMIXTURE SHALL BE RHEOCRETE CN1 CALCIUM NITRATE-BASED CORROSION INHIBITOR, DCI S CORROSION INHIBITOR OR AN APPROVED EQUAL. ADDITION OF CORROSION INHIBITING ADMIXTURE SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
- D. ALL INSERTS, ANCHOR BOLTS, PLATES, ETC. EMBEDDED IN CONCRETE SHALL BE HOT-DIP GALVANIZED UNLESS OTHERWISE NOTED.
- E. CONSTRUCTION JOINTS MAY BE RELOCATED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. CONSTRUCTION JOINTS SHALL BE MADE AND RELOCATED AS NOT TO IMPAIR THE STRENGTH OF THE STRUCTURE AND TO MINIMIZE SHRINKAGE STRESSES. ALL CONSTRUCTION JOINTS SHALL BE CLEANED, LAITANCE REMOVED AND WETTED. SEE TYPICAL DETAILS FOR SPECIFIC REQUIREMENTS.
- F. UNLESS OTHERWISE NOTED, CHAMFER ALL CONCRETE EDGES 3/4".
- G. 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.
- H. REINFORCING BARS, ANCHOR BOLTS, INSERTS AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.

REINFORCING STEEL:

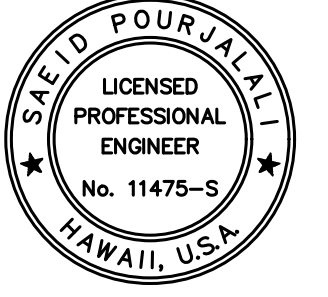
- A. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 UNLESS OTHERWISE NOTED.
- B. CLEAR CONCRETE COVERAGE FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
 - a. FOOTING CAST AGAINST EARTH ----- 3"
 - b. FOOTING FORMED AND EXPOSED TO EARTH ----- 2"
 - c. WALL FACES EXPOSED TO EARTH OR WEATHER ----- 2"
- C. STAINLESS STEEL REINFORCING BARS SHALL BE TYPE 316 GRADE CONFORMING TO ASTM A955 GRADE 60.
- D. SPLICES:
 - a. REINFORCING STEEL SHALL BE SPLICED ONLY WHERE INDICATED ON PLANS.

FIBERGLASS REINFORCED STRUCTURAL MEMBERS:

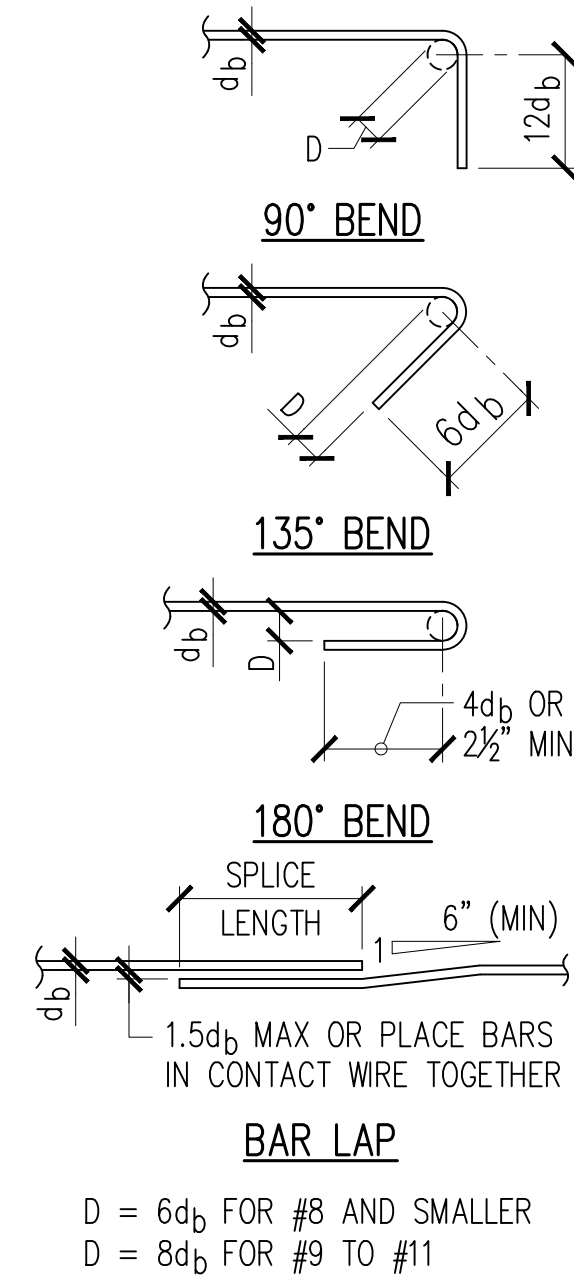
- A. FIBERGLASS-REINFORCED PLASTIC STRUCTURAL SHAPES SHALL BE MANUFACTURED BY THE PULTRUDED METHOD FROM A NON-FLAME RETARDANT ISOPHTHALIC POLYESTER RESIN SYSTEM. THE MEMBERS SHALL HAVE A MINIMUM TENSILE AND COMPRESSIVE STRESS IN THE LENGTHWISE DIRECTION OF 30 KSI (ASTM D638), A MINIMUM FLEXURAL STRESS LENGTHWISE OF 30 KSI (ASTM D790) AND A MODULUS OF ELASTICITY OF 2,800 KSI.
- B. ALL BOLTED CONNECTIONS FOR FRP MEMBERS SHALL BE WITH STAINLESS STEEL BOLTS IN CONFORMANCE WITH ASTM F593.
- C. ALL BOLTS SHALL BE 316 STAINLESS STEEL.
- D. INSTALL BEAMS WITH ANY CROWN IN MEMBER ORIENTED UPWARD.
- E. STAINLESS STEEL WEDGE ANCHORS SHALL HAVE A CURRENT ICC ES REPORT. ANCHORS SHALL BE INSTALLED PER PRODUCTS ICC ES REPORT.
- F. MEMBERS SHALL BE INSTALLED IN A MANNER THAT WILL ALLOW THEM TO BE REMOVED IN THE FUTURE BY REMOVING BOLTS, AND NO EXTRAORDINARY EFFORT.

STRUCTURAL STEEL:

- A. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION, FIFTEENTH EDITION.
- B. ALL STRUCTURAL STEEL SHALL BE 316 STAINLESS AND CONFORM TO ASTM F593.

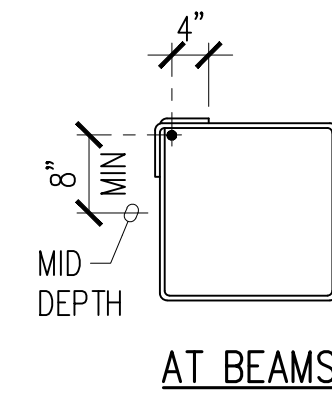
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS STRUCTURAL NOTES					
DESIGNED: CS		SUBMITTED: XX			
DRAWN: CAD		DATE: XX			
CHECKED: SP		SCALE: XX			
APPROVED:					DRAWING NO.
					S-1
EXPIRATION DATE OF THE LICENSE 4/30/2022 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION					DATE
CHIEF ENGINEER					

MINIMUM SPLICE AND EMBEDMENT LENGTHS					
CONCRETE STRENGTH = 4,000 PSI					
BAR SIZE	LAP SPLICE		DEVELOPMENT		
	TOP BARS	OTHER BARS	STRAIGHT OTHER BARS	TOP BARS	WITH STANDARD HOOK
#3	29"	21"	12"	17"	10"
#4	29"	21"	12"	17"	10"
#5	36"	26"	15"	21"	12"
#6	43"	31"	18"	26"	16"
#7	54"	39"	23"	32"	18"
#8	71"	51"	30"	42"	20"
#9	90"	64"	38"	53"	22"
#10	114"	81"	48"	67"	26"
#11	140"	100"	59"	82"	28"



TYPICAL REBAR SPLICE AND DEVELOPMENT LENGTH SCHEDULE

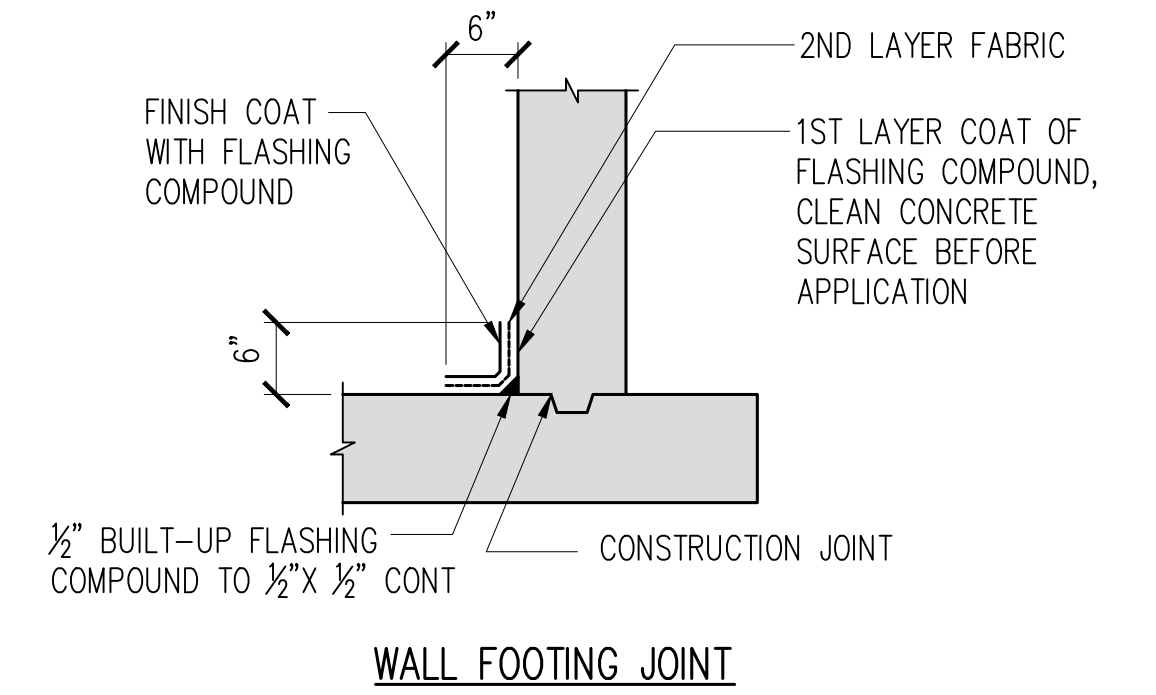
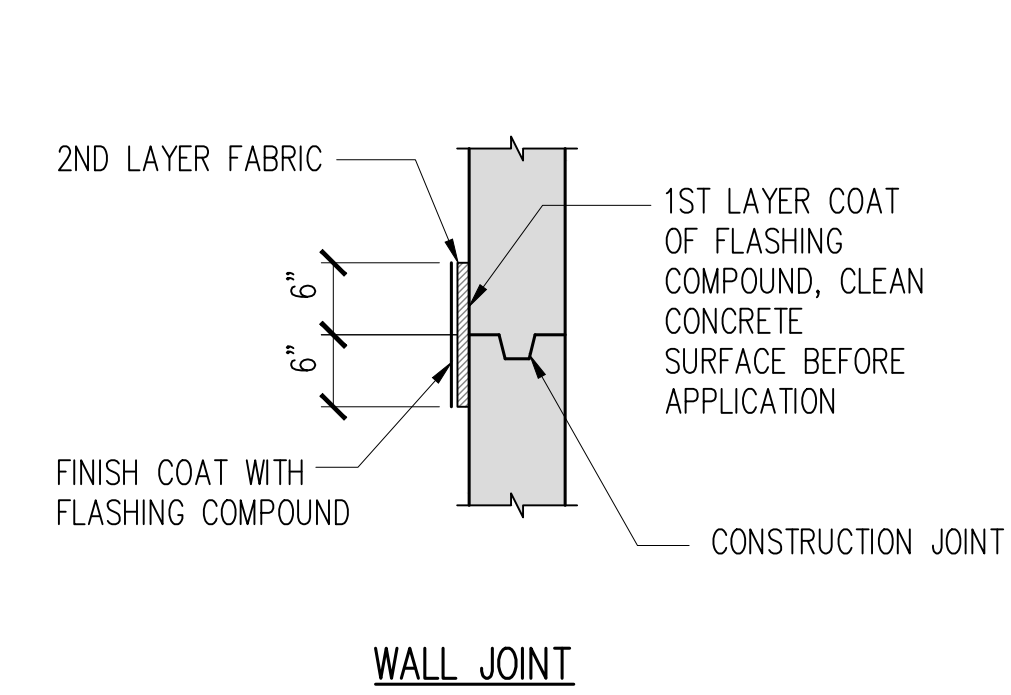
1
S-2 NOT TO SCALE



NOTE:
1. THESE DETAILS SHALL APPLY TO #3, #4, AND #5 BARS - GRADE 40 AND GRADE 60.
2. ALL BARS SHALL BE BENT COLD.

TYPICAL TIE AND STIRRUPS DETAIL

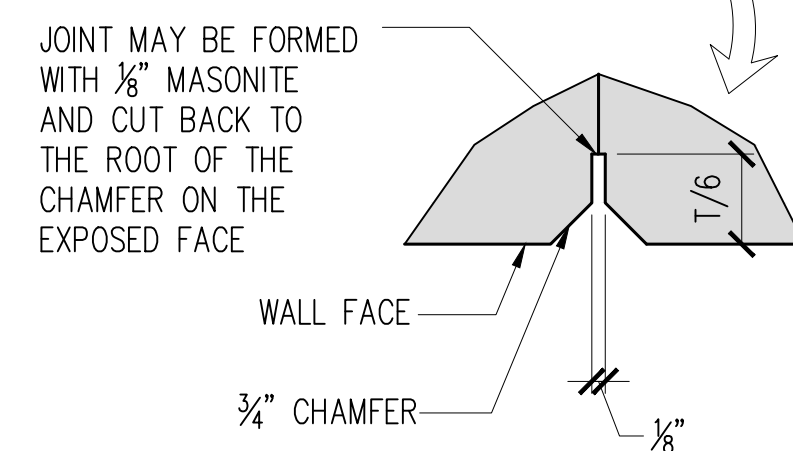
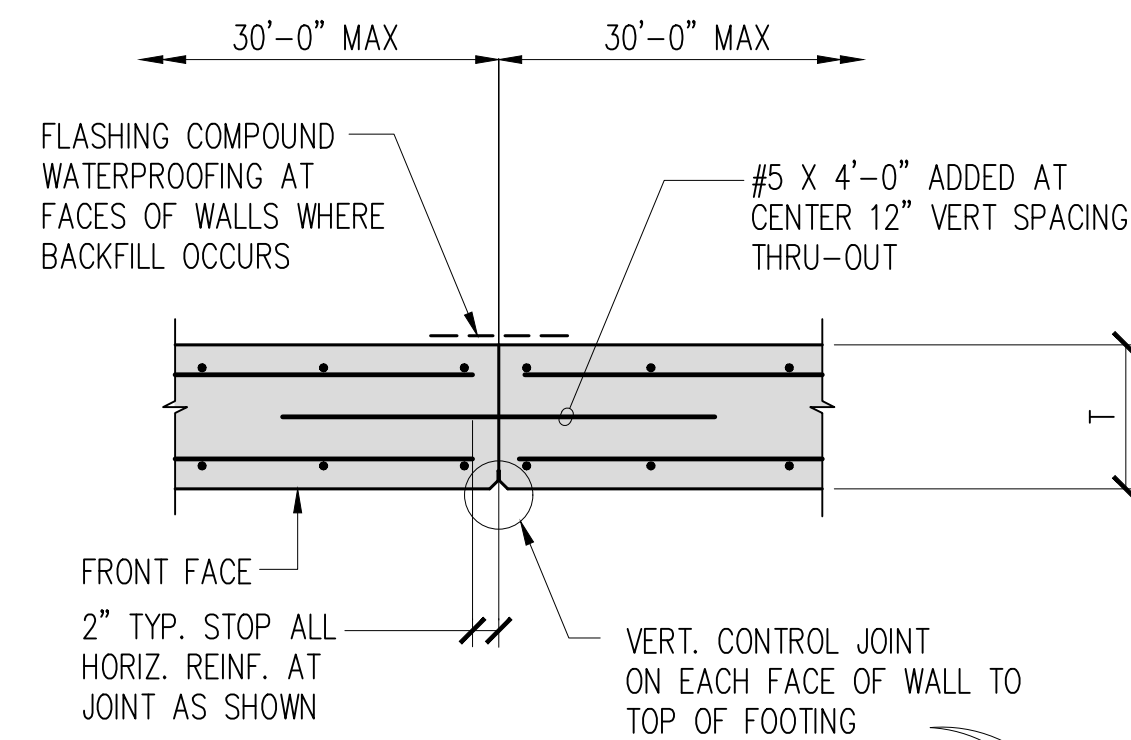
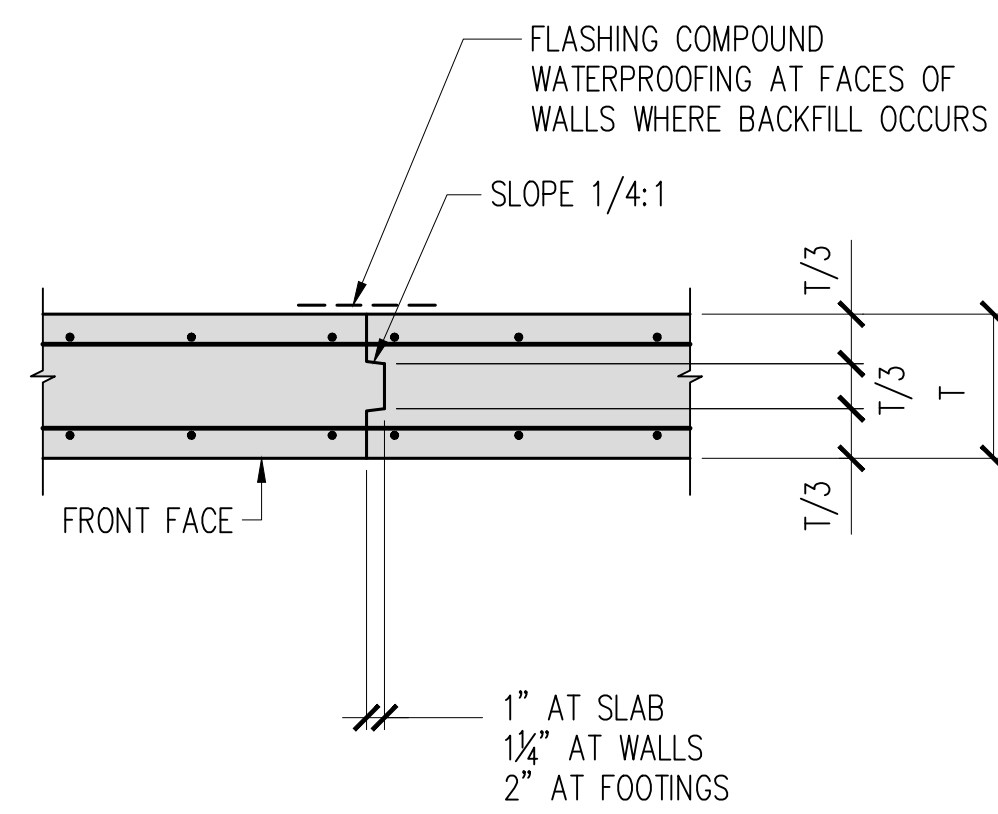
2
S-2 NOT TO SCALE



NOTE: TYPICAL EACH FACE UNLESS NOTED OTHERWISE

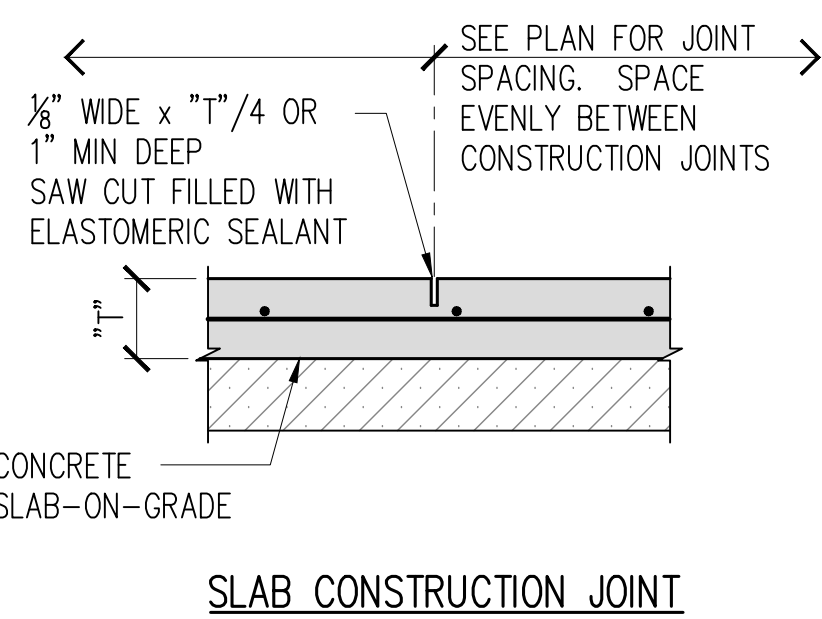
TYPICAL WATERPROOFING DETAIL

3
S-2 NOT TO SCALE



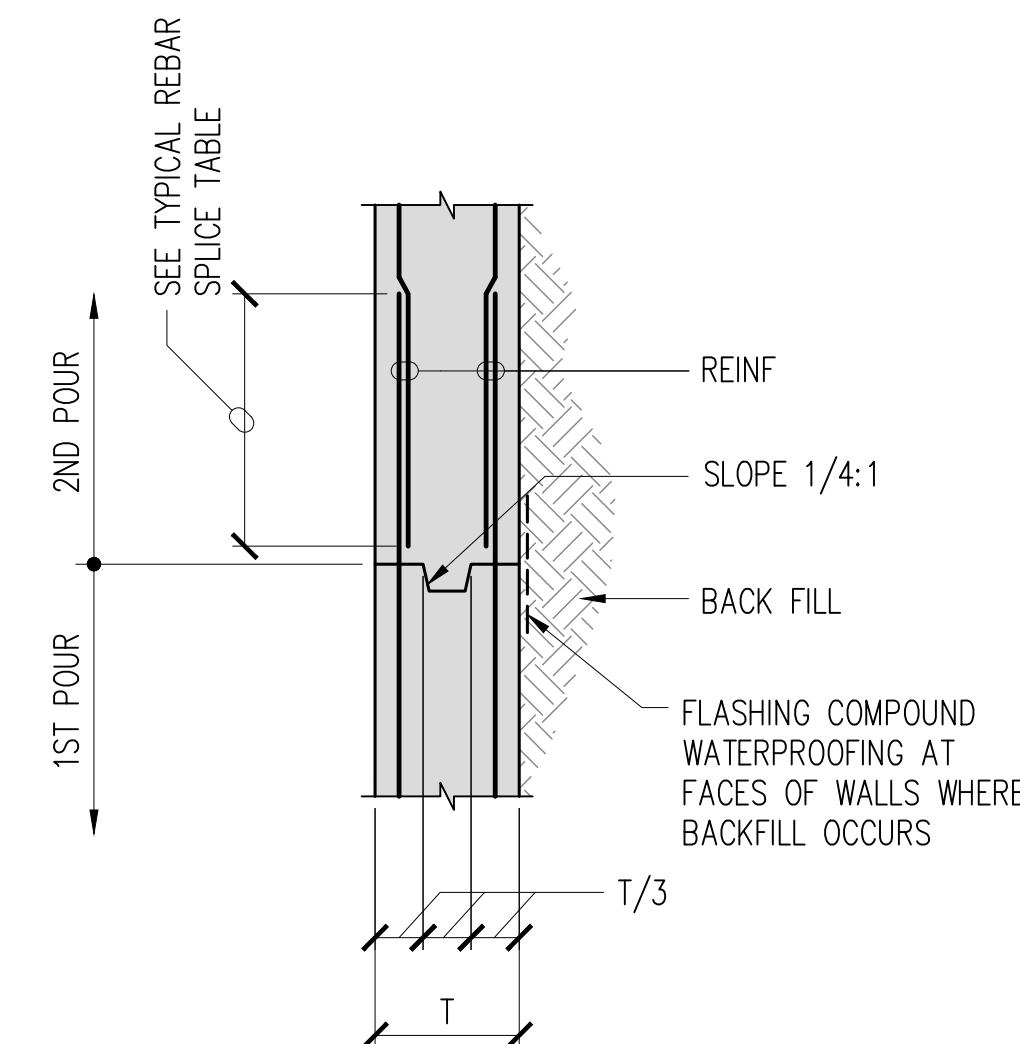
NOTES:
1. SAW CUTTING SHALL OCCUR AS SOON AS CONCRETE SURFACE IS FIRM ENOUGH TO NOT BE TORN BY CUTTING BLADE AND BEFORE SHRINKAGE CRACKING OCCURS, BUT NO LATER THAN 12 HOURS AFTER CONCRETE HAS BEEN POURED.
2. UNLESS NOTED OTHERWISE SUBMIT JOINTING PLANS FOR REVIEW.

RETAINING WALL CONSTRUCTION JOINT



TYPICAL JOINT DETAILS

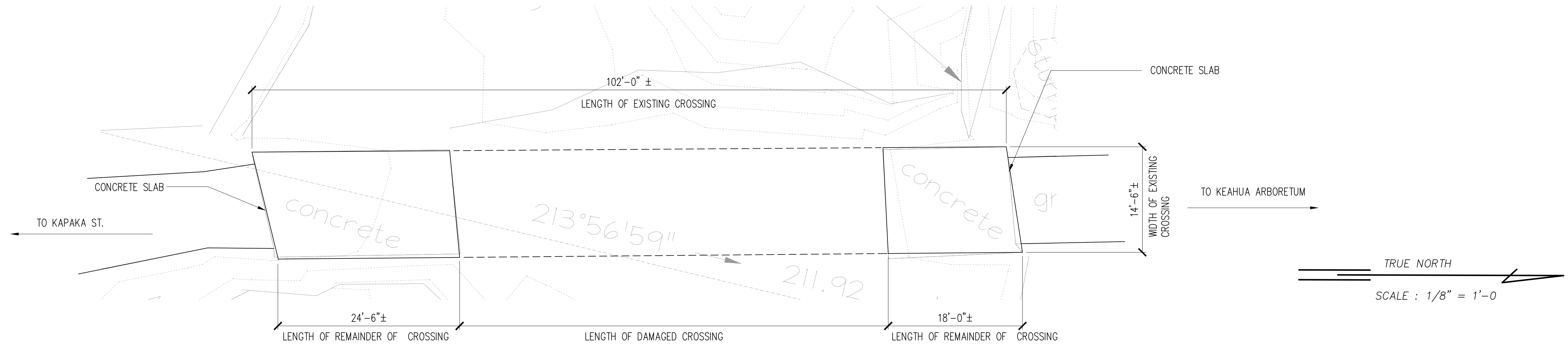
4
S-2 NOT TO SCALE



TYPICAL REBAR LAP DETAILS AT JOINT

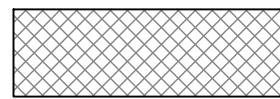
5
S-2 NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS TYPICAL DETAILS					
DESIGNED: CS			SUBMITTED: XX		
DRAWN: CAD			DATE: XX		
CHECKED: SP			SCALE: XX		
APPROVED:			DRAWING NO.		
CHIEF ENGINEER			DATE		
			S-2		

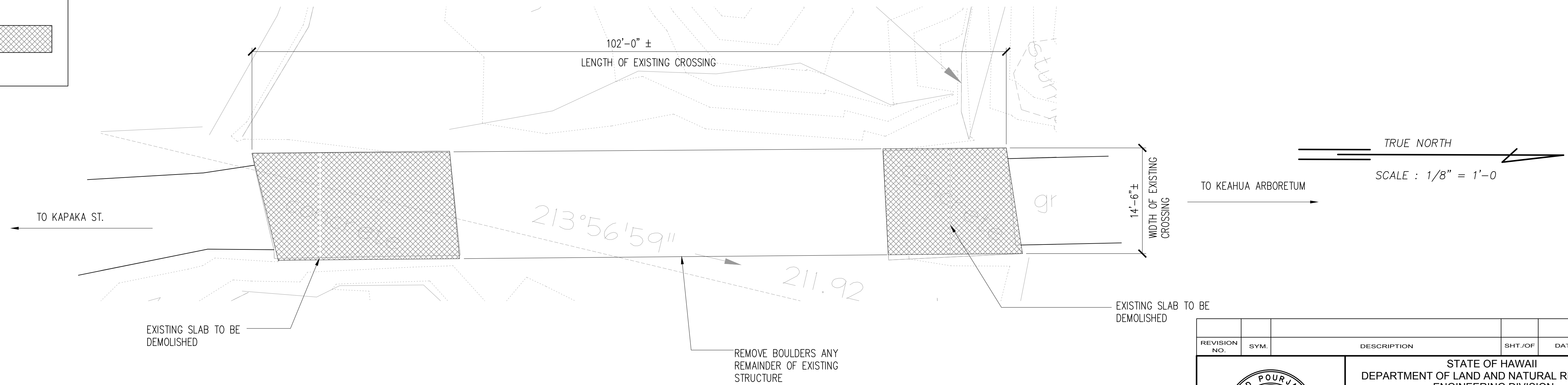


1 EXISTING QUEENSLAND CROSSING- PLAN VIEW
 S-3 SCALE: 1/8" = 1'-0"

LEGEND:

DENOTES DEMOLITION AREA 

NOTE:
 SEE CIVIL DRAWINGS FOR
 APPROACH ROADWAYS
 DEMOLITION PLAN

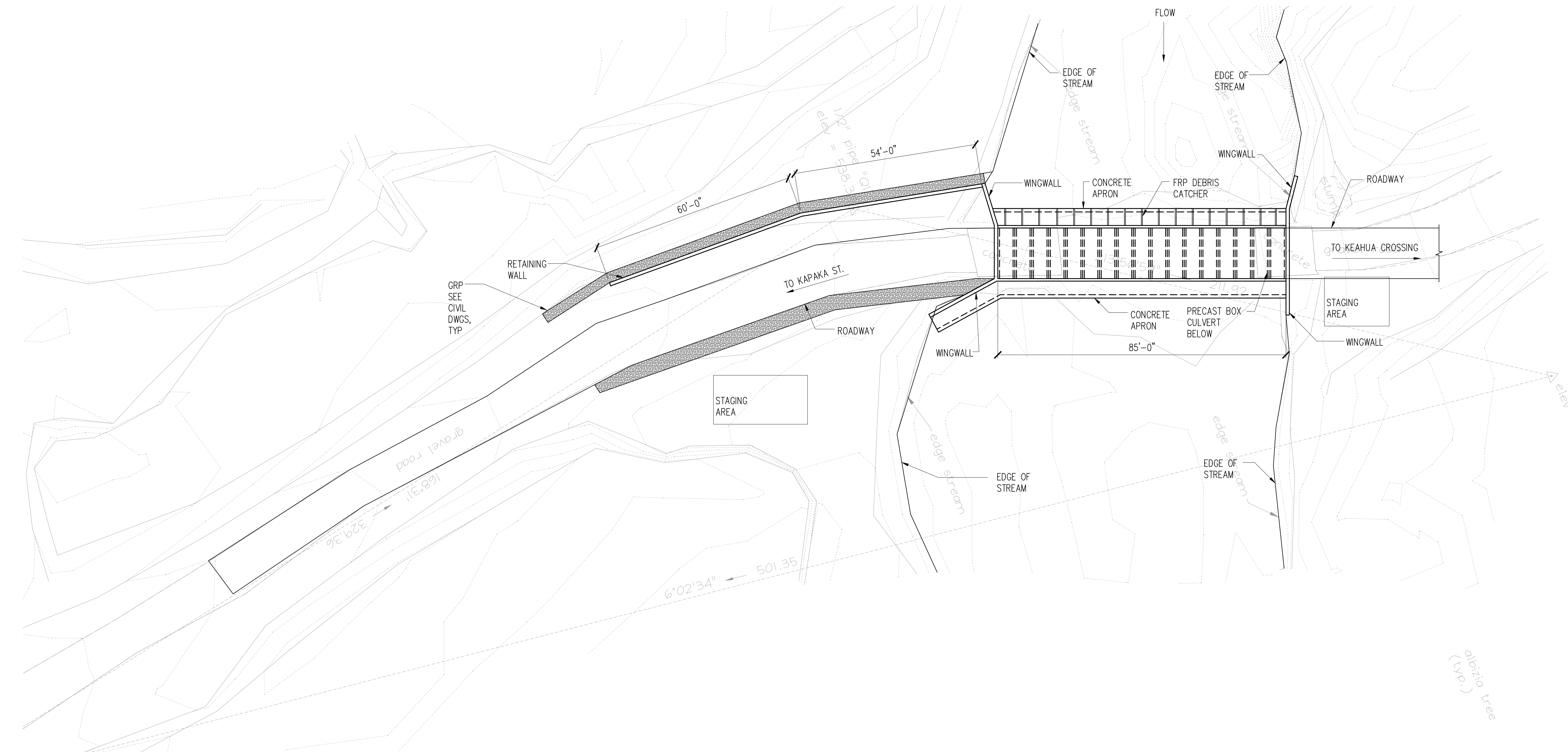


2 EXISTING QUEENSLAND CROSSING DEMO- PLAN VIEW
 S-3 SCALE: 1/8" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS QUEENSLAND CROSSING DEMO PLAN					
DESIGNED:	CS	SUBMITTED:	XX		
DRAWN:	CAD	DATE:	XX		
CHECKED:	SP	SCALE:	XX		
APPROVED:				DRAWING NO.	S-3
EXPIRATION DATE OF THE LICENSE 4/30/2022 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION			CHIEF ENGINEER	DATE	

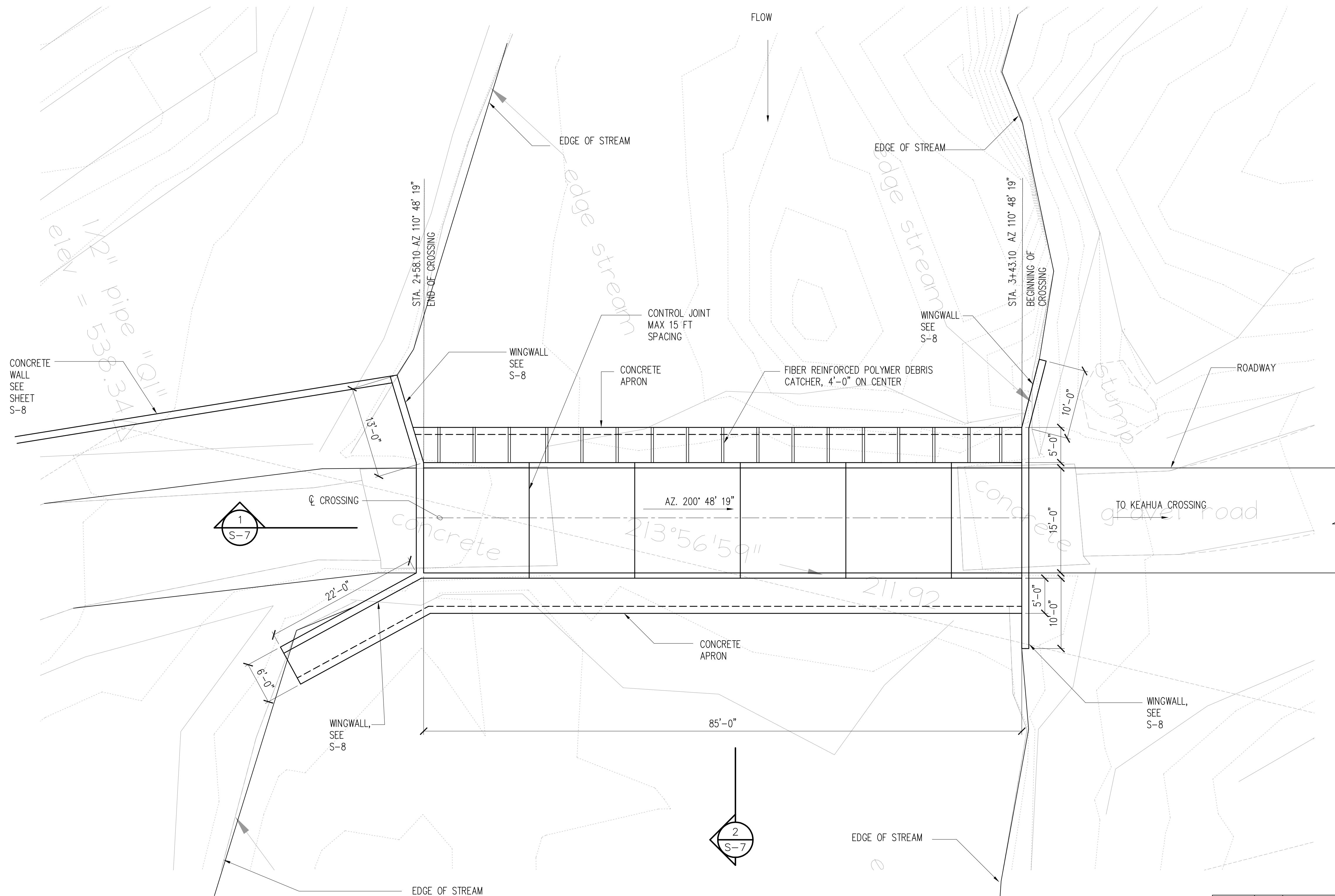
TRUE NORTH
SCALE : 1/16" = 1'-0"



1 QUEENSLAND CROSSING IMPROVEMENT PLAN VIEW
S-4 SCALE: 1/16" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS QUEENSLAND CROSSING IMPROVEMENT PLAN VIEW					
DESIGNED: CS			SUBMITTED: XX		
DRAWN: CAD			DATE: XX		
CHECKED: SP			SCALE: XX		
APPROVED:					DRAWING NO.
CHIEF ENGINEER					S-4

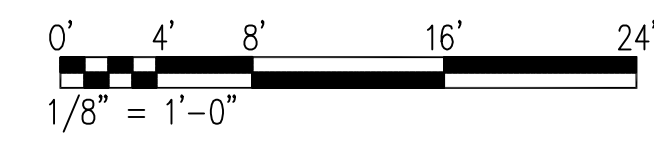


TRUE NORTH
 SCALE : 1/8" = 1'-0"

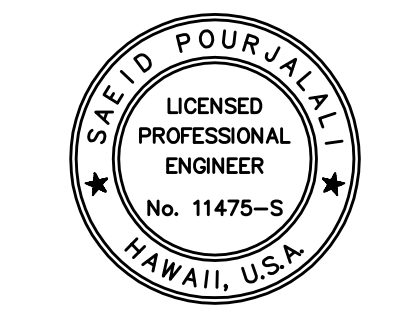
1
S-7

2
S-7

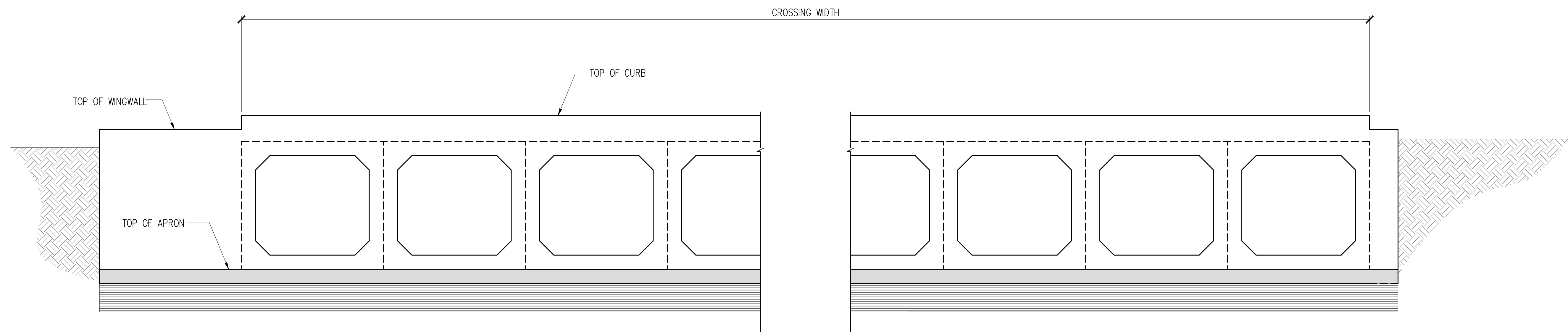
1 QUEENSLAND CROSSING PLAN VIEW
 S-5 SCALE: 1/8" = 1'-0"



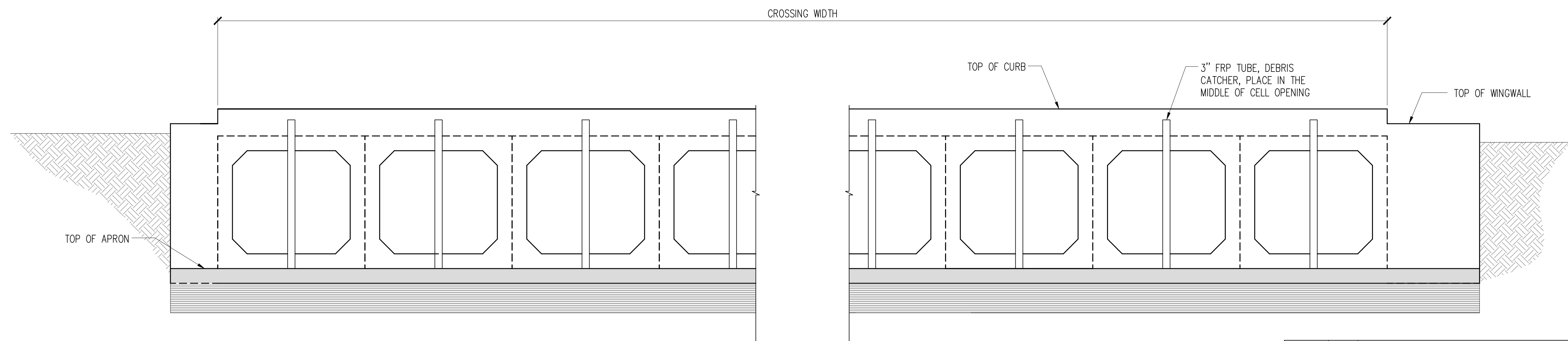
REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS QUEENSLAND CROSSING PLAN					
DESIGNED:	CS	SUBMITTED:	XX		
DRAWN:	CAD	DATE:	XX		
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APPROVED:				DRAWING NO.	S-5
CHIEF ENGINEER				DATE	



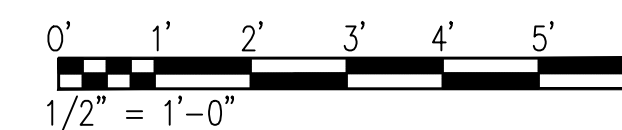
EXPIRATION DATE OF THE LICENSE 4/30/2022
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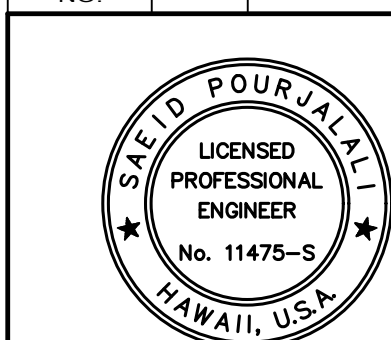
1 CROSSING DOWNSTREAM ELEVATION
S-6 SCALE: 1/2" = 1'-0"

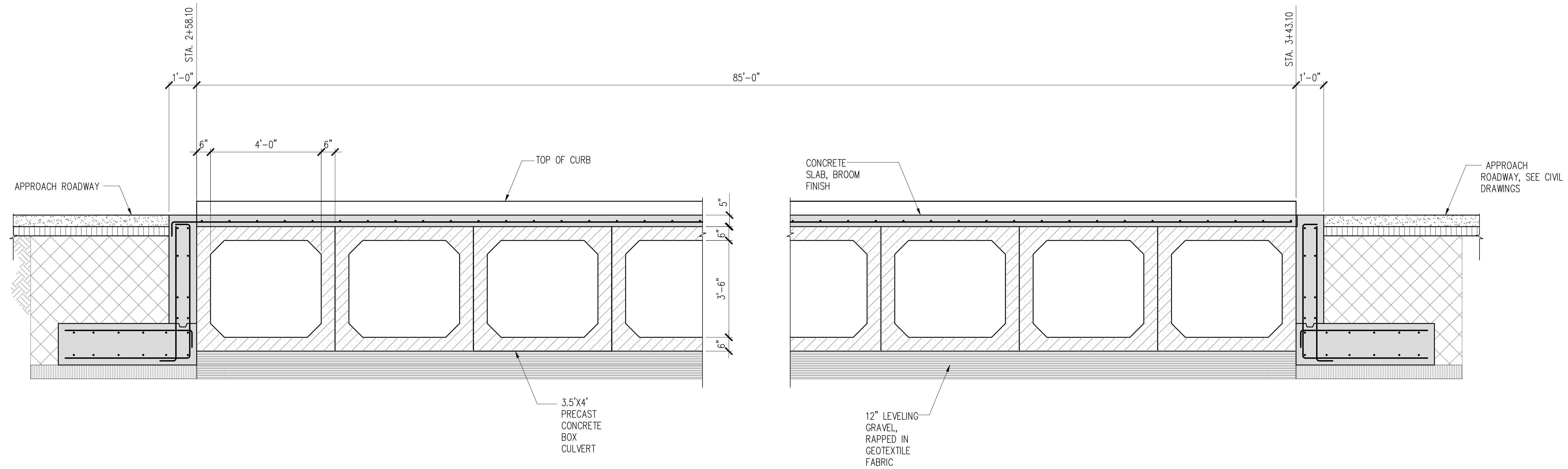


2 CROSSING UPSTREAM ELEVATION
S-6 SCALE: 1/2" = 1'-0"

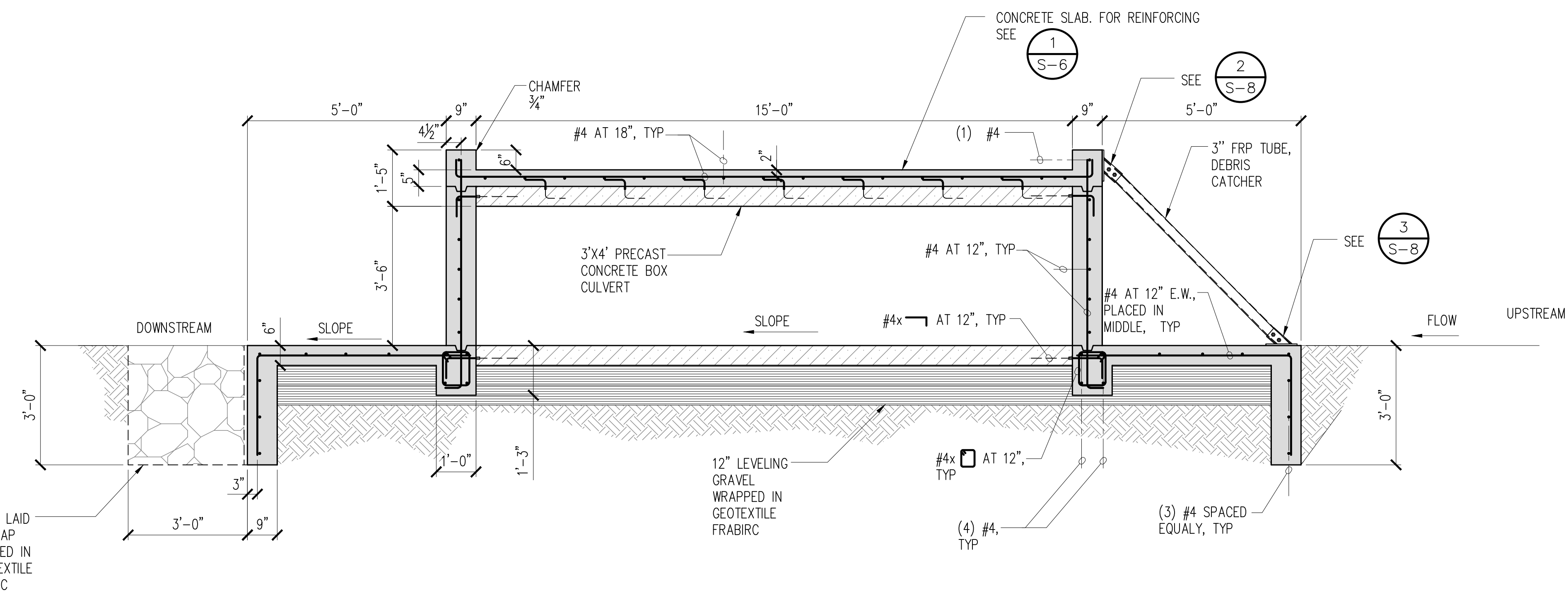


REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS QUEENSLAND CROSSING ELEV.					
DESIGNED:	CS	SUBMITTED:	XX		
DRAWN:	CAD	DATE:	XX		
CHECKED:	SP	SCALE:	XX		
APPROVED:				DRAWING NO.	S-6
CHIEF ENGINEER			DATE		

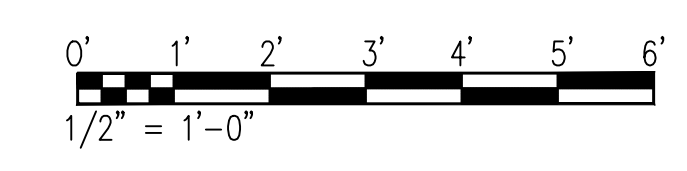




1 CROSSING LONG. SECTION
 S-7 SCALE: 1/2" = 1'-0"

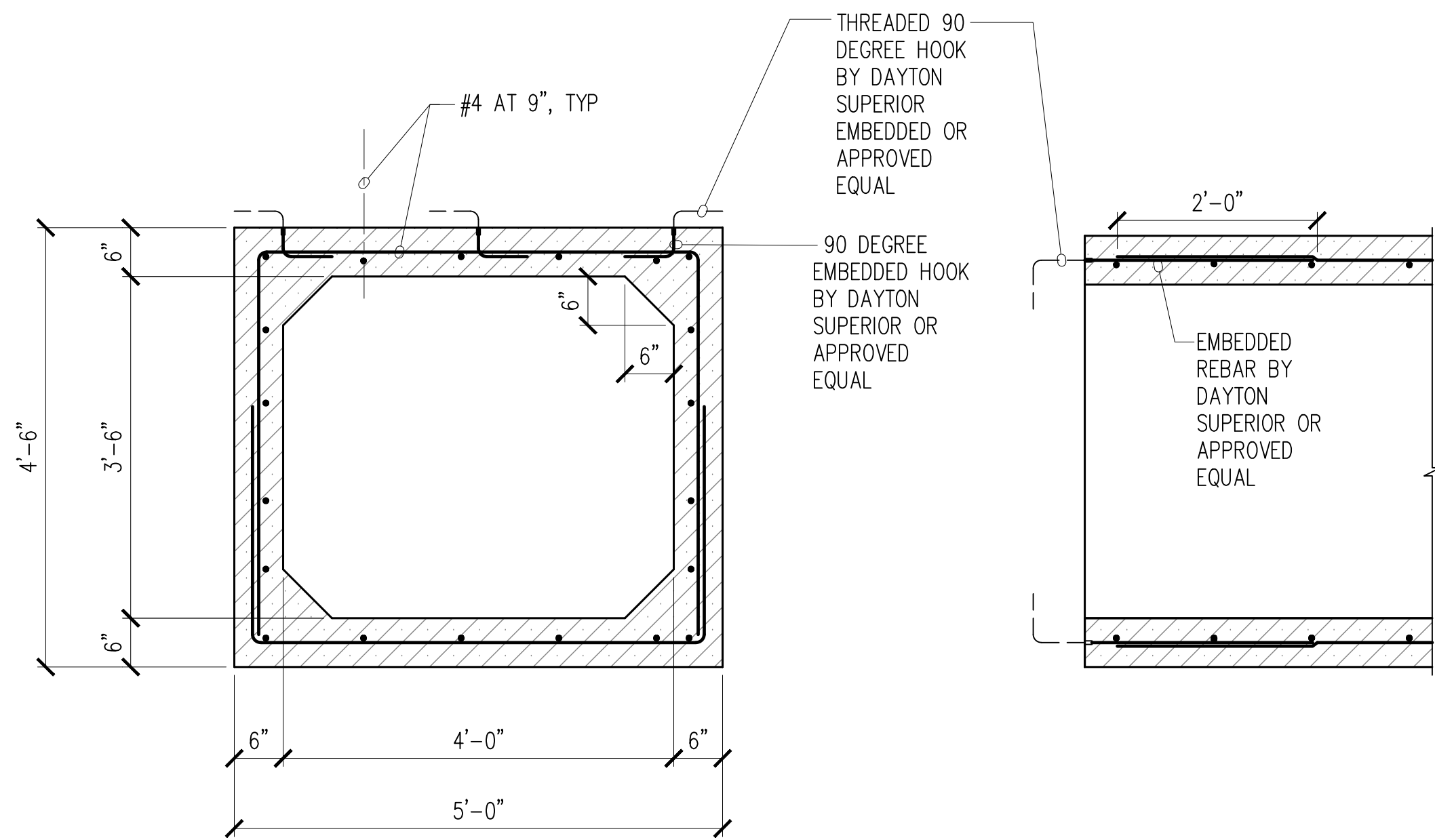


2 CROSSING TRAN. SECTION
 S-7 SCALE: 1/2" = 1'-0"

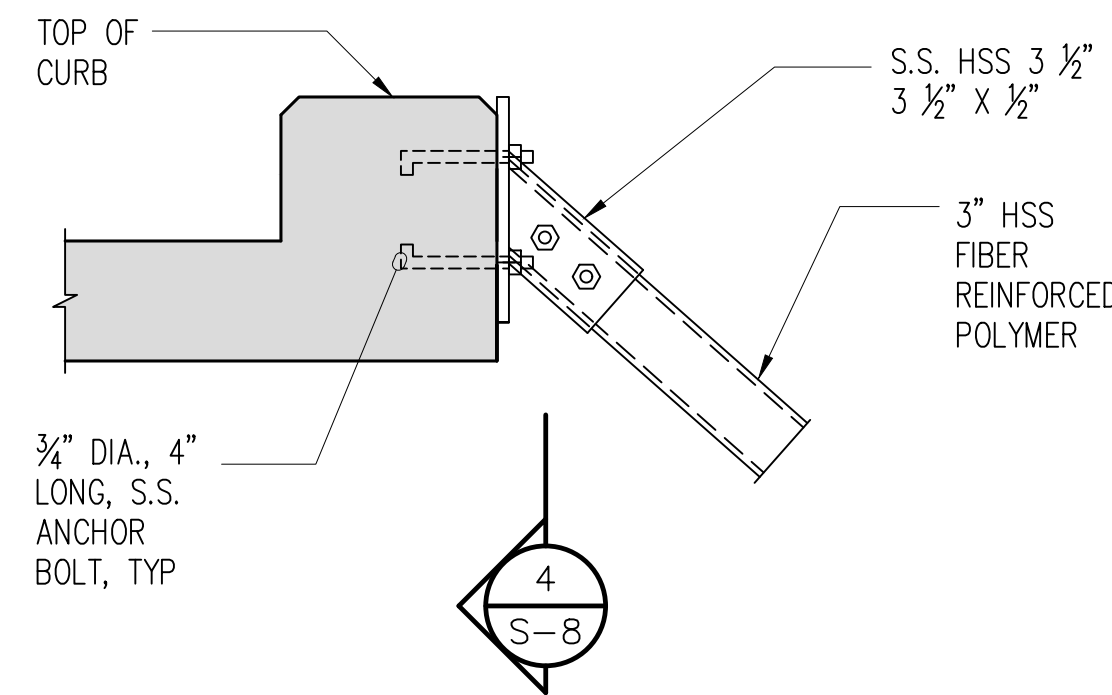


REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS QUEENSLAND CROSSING SECTIONS					
DESIGNED:	CS	SUBMITTED:	XX	DATE:	XX
DRAWN:	CAD	CHECKED:	SP	SCALE:	XX
APPROVED:					DRAWING NO.
CHIEF ENGINEER					S-7

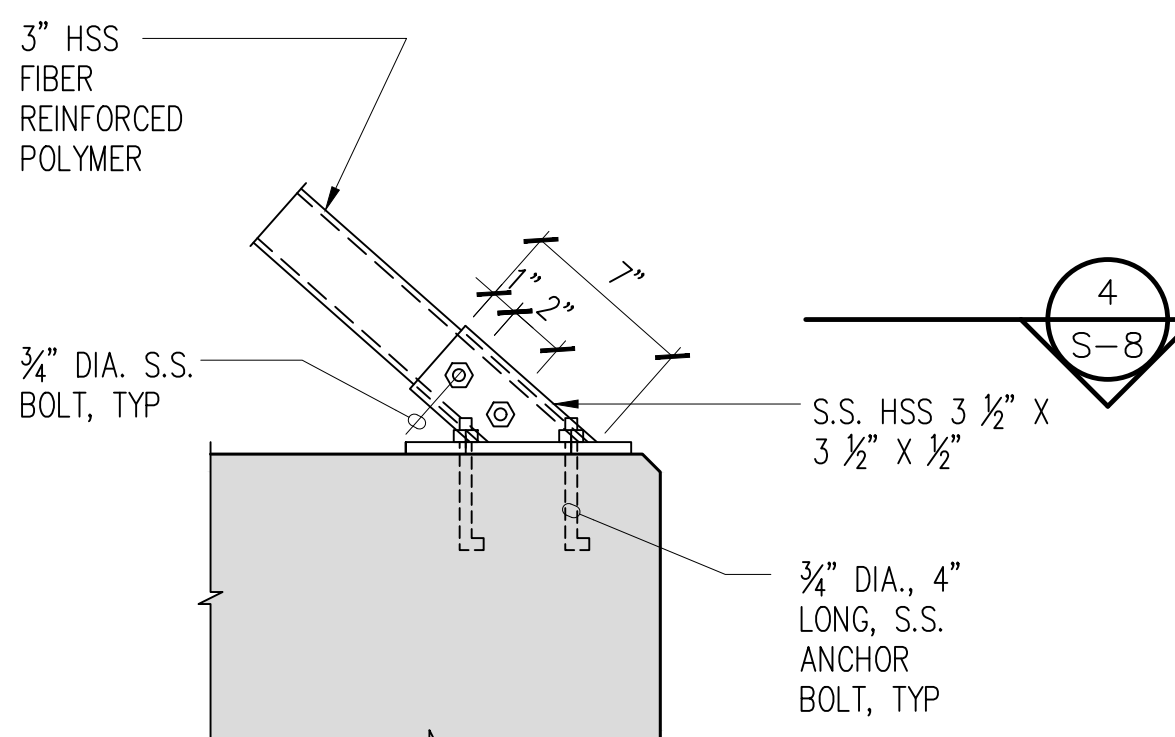
EXPIRATION DATE OF THE LICENSE 4/30/2022
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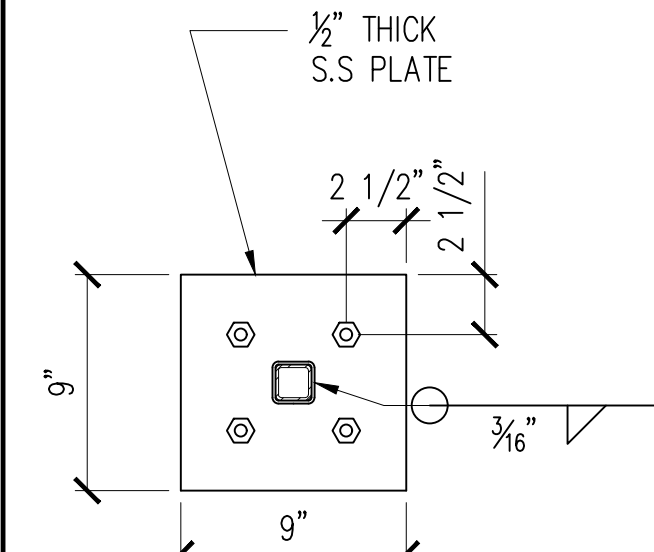
1 PRECAST CULVERT SECTIONS
S-8 SCALE: 3/4" = 1'-0"



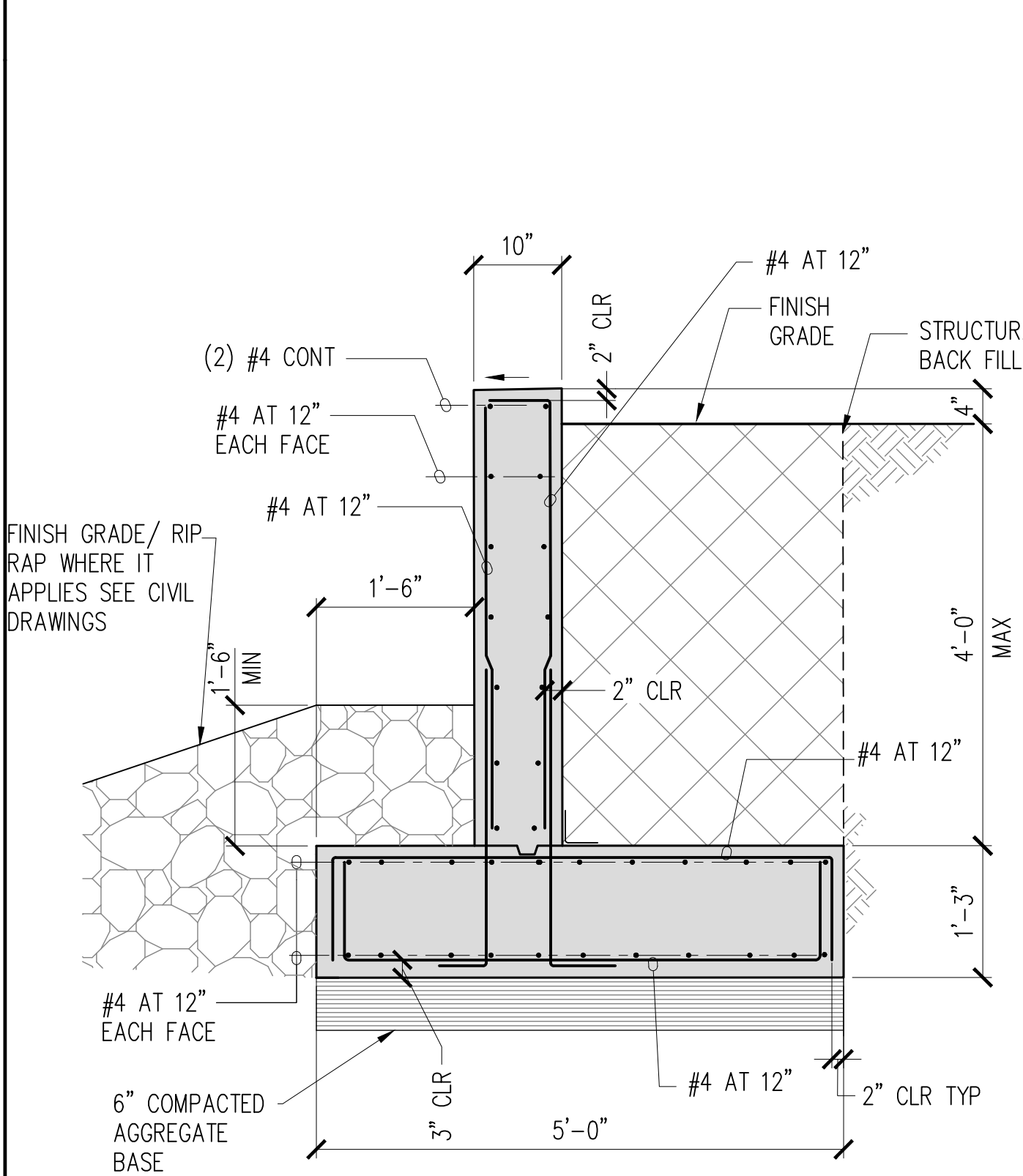
2 DEBRIS CATCHER CONNECTION
S-8 SCALE: 1/2" = 1'-0"



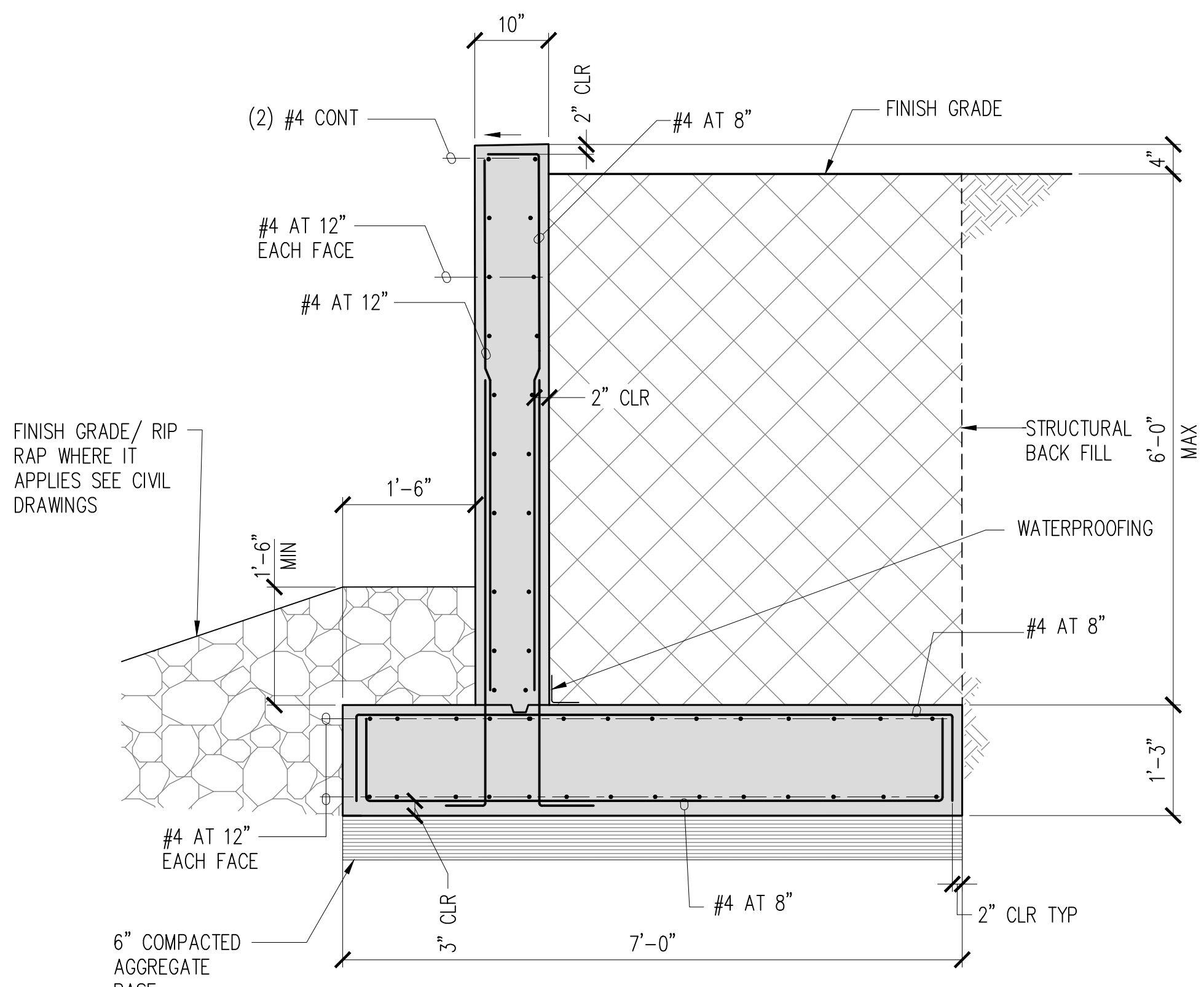
3 DEBRIS CATCHER CONNECTION
S-8 SCALE: 1 1/2" = 1'-0"



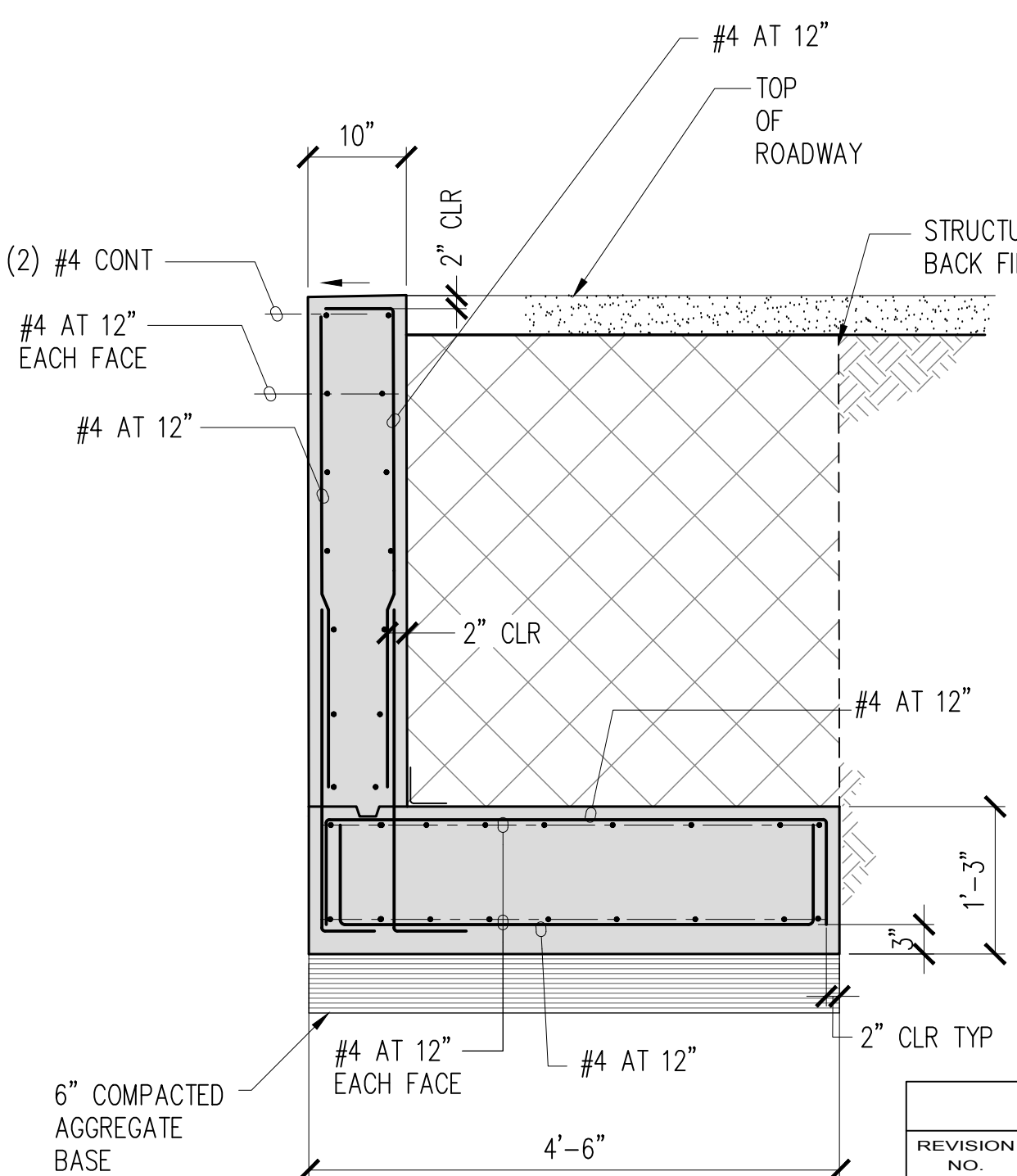
4 SECTION
S-8 SCALE: 1 1/2" = 1'-0"



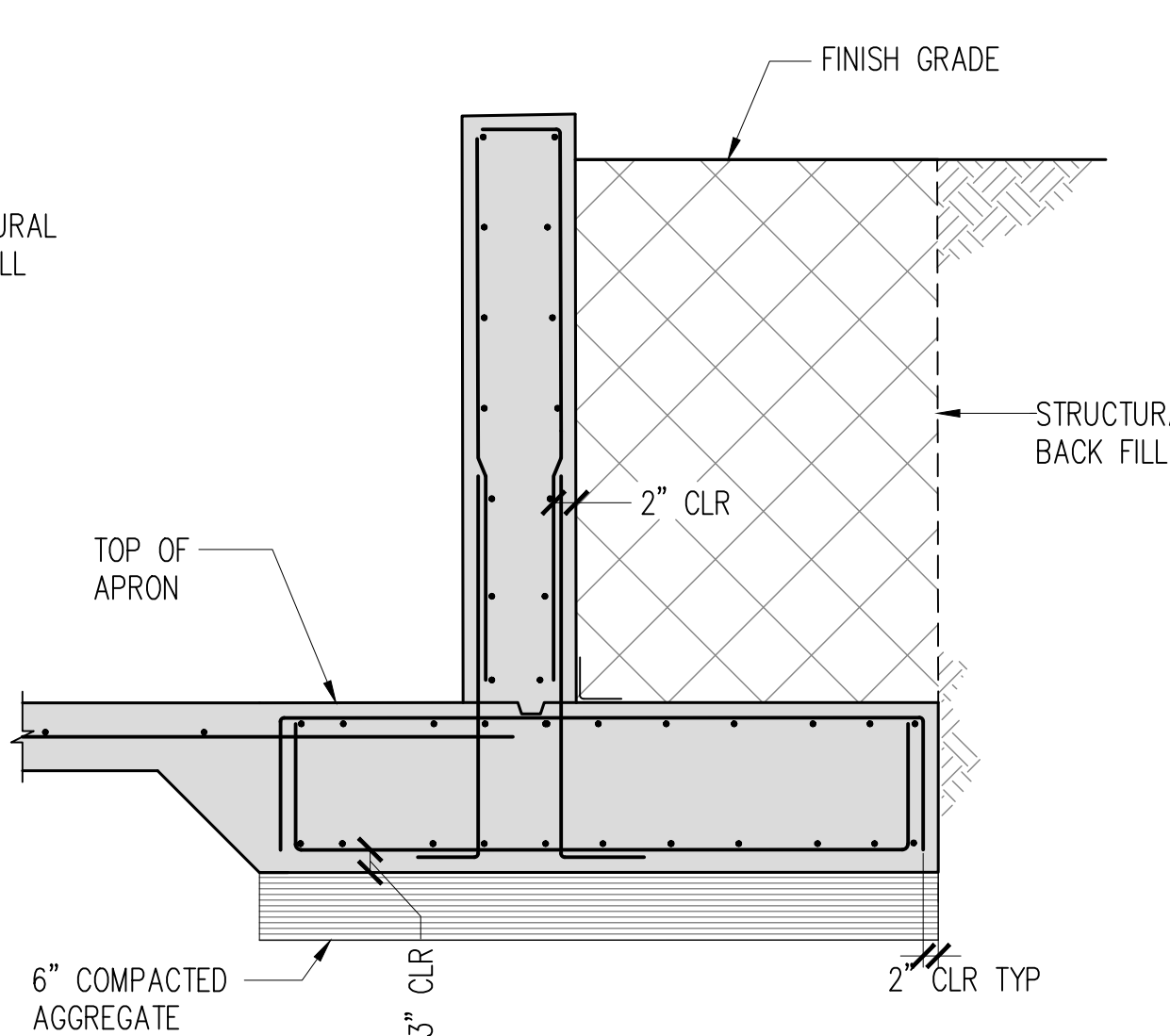
WALL LESS THAN 4'-0" HIGH



WALL LESS BETWEEN 4'-0" AND 6'-0" HIGH

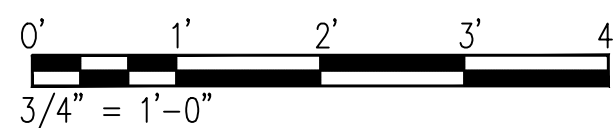


WALL AT CULVERT



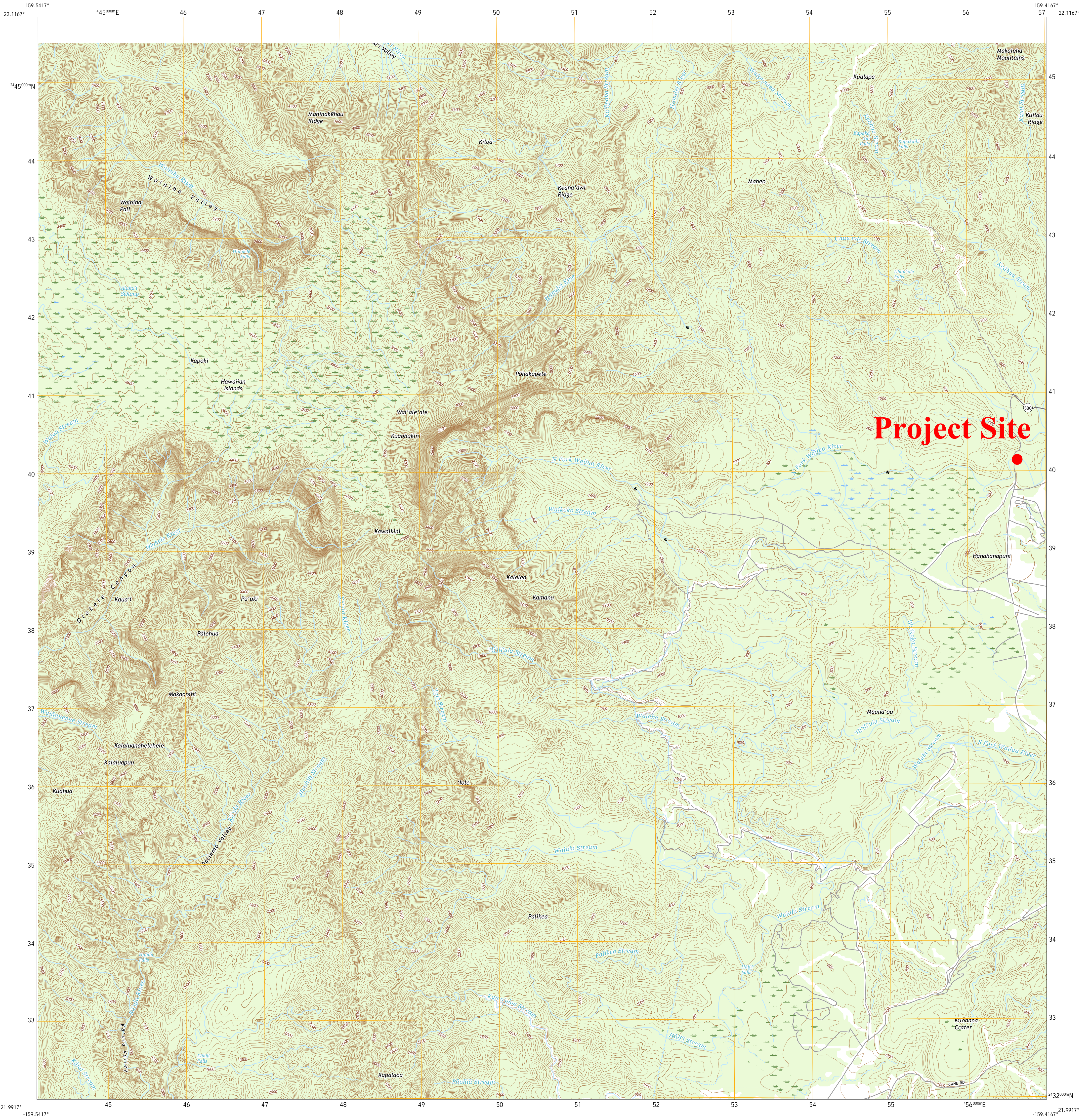
WALL CONNECTION AT APRON

5 RETAINING WALL SECTIONS
S-8 SCALE: 3/4" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSINGS WING WALL & CULVERT SECTIONS					
DESIGNED:	CS	SUBMITTED:	XX		
DRAWN:	CAD	DATE:	XX		
CHECKED:	SP	SCALE:	XX		
APPROVED:				DRAWING NO.	S-8
CHIEF ENGINEER				DATE	

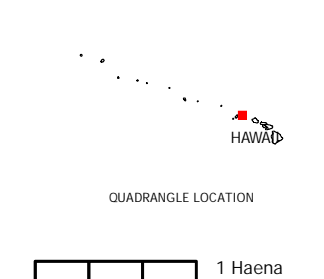
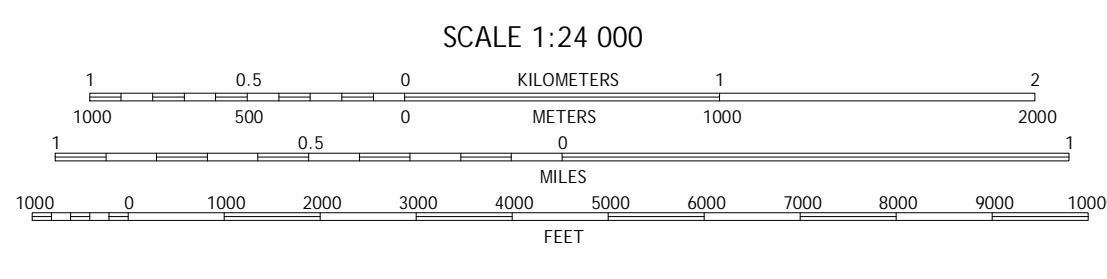
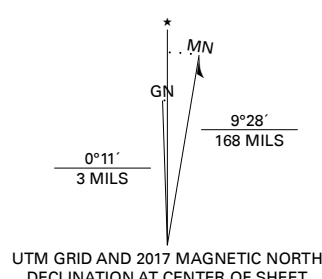
EXPIRATION DATE OF THE LICENSE 4/30/2022
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Produced by the United States Geological Survey

North American Datum of 1983 (NAD83) World Geodetic System of 1984 (WGS84) Projection and 1000-meter grid: Universal Transverse Mercator, Zone 4Q This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery: NAIP, June 2014 U.S. Census Bureau, 2017 Names: GNS, 1981-2017 Hydrography: National Hydrography Dataset, 2001-2017 Contours: National Elevation Dataset, 2000-2015 Boundaries: Multiple sources; see metadata file 2014-2016 Wetlands: FWS National Wetlands Inventory 1976-2013



ADJOINING QUADRANGLES

1	2	3
4	5	6
7	8	

1 Haena
2 Hanalei
3 Anahola
4 Waimea Canyon
5 Kapa'a
6 Hanalei
7 Koloa
8 Lihue

ROAD CLASSIFICATION

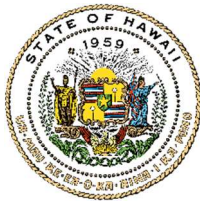
Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
	State Route

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011. A metadata file associated with this product is draft version 0.6.18



JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

ENGINEERING DIVISION
P.O. BOX 373
HONOLULU, HAWAII 96809
May 2, 2023

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT
LAURA H.E. KAAKUA
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

VIA E-MAIL (michael.cain@hawaii.gov)

TO: Michael Cain, Administrator
Office of Conservation and Coastal Lands

THROUGH: David Smith, Administrator 
Division of Forestry and Wildlife

FROM: Carty S. Chang, Chief Engineer 
Engineering Division

SUBJECT: Project No. D00AK67B Lihue-Koloa Forest Reserve Queensland Loop Road Low
Water Crossing, Kauai, Hawaii
TMK: (4) 4-2-001:002

We request your assistance in determining if the subject project, proposed by the Division of Forestry and Wildlife, will require the completion of a Conservation District Use or Site Plan Approval Application. The project site is within the Lihue-Koloa Forest Reserve, which is under the management of the Division of Forestry and Wildlife, TMK (4) 4-2-001:002, and in the Conservation District, Resource Subzone (See attached maps). The project site is located along the Wailua River North Fork, where the existing Loop Road crosses the river. This crossing is known as the Queensland Crossing.

The 50+ year-old concrete crossing was damaged during two flooding events in March 2018 and May 2020. Due to these events, the structure is washed out, and crossing the stream has become difficult for most vehicles. The following describes the existing condition before flooding, the damages to the crossing due to the flooding events, and the proposed repairs for the crossing.

Previous (Existing) Structure

The existing crossing structure consisted of (10) 36" diameter corrugated metal pipes (CMP) culverts placed next to each other. A concrete slab was placed on top of the CMP pipes to make a 60 ft long by 14.5 ft wide crossing within the stream. On each side of the crossing, a concrete approach slab was constructed, and each approach slab was approximately 25 ft long making the entire crossing structure 100 ft long. Beyond the approach slab, the access roads were dirt roads.

Damages

The 2018 and 2020 flooding events destroyed the structure completely and the roadway beyond the approach roadways. The length of the affected area is approximately 150 feet. Due to the force of the rushing water during the flood events, a portion of the stream bed was realigned on the upstream side of the crossing. It is evident that during a high-volume stream flow, the approach roadway after the crossing will be affected.

Proposed Repair Work

To restore the crossing, an 85 ft long x 15 ft wide structure will be placed within the stream. The new structure consists of 3'-6"H x 4'W precast concrete box culverts spanning the stream and structurally tied together through a reinforced concrete slab poured on top of the box culverts. The length of the crossing is increased to accommodate the stream widening due to flooding. Attached to the reconstructed crossing will include five-foot-wide concrete aprons upstream and downstream of the crossing with a debris catcher on the upstream apron to prevent clogging of the box culverts. Wingwalls, which are needed along both banks upstream and downstream to prevent scour of the crossing and roadway will be built.

In addition, the project will also include construction of a new retaining wall, extending 114 feet south of the crossing along the west side of the access road, to manage flood water from an upstream breach of the river that occurred in 2018. During that flood event, water breached the channel and flowed through this area, further damaging the crossing and the roadway. The retaining wall is intended to protect the access road from further damage during future flood events. The project also includes improvements to the access road north and south of the stream, and placement of grouted riprap along the roadsides and on the west side of the retaining wall. Grading of the roadway will be conducted as necessary to provide transition from the road to the low-water crossing.

The project plans are located at this link: [Plans.pdf](#)

In accordance with Chapter 11-200.1, HAR, we propose to exempt the project from the preparation of an environmental assessment pursuant to the following:

Per DLNR November 10, 2020 Exemption List, Exemption Type	Exemption Type 2 <i>Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced.</i> PART 2 11. Replacement or reconstruction of existing bridges and flumes. Exemption Type 3 <i>Construction and location of single, new, small facilities or structures and the alteration and modification of the facilities or structures and installation of new, small equipment or facilities and</i>
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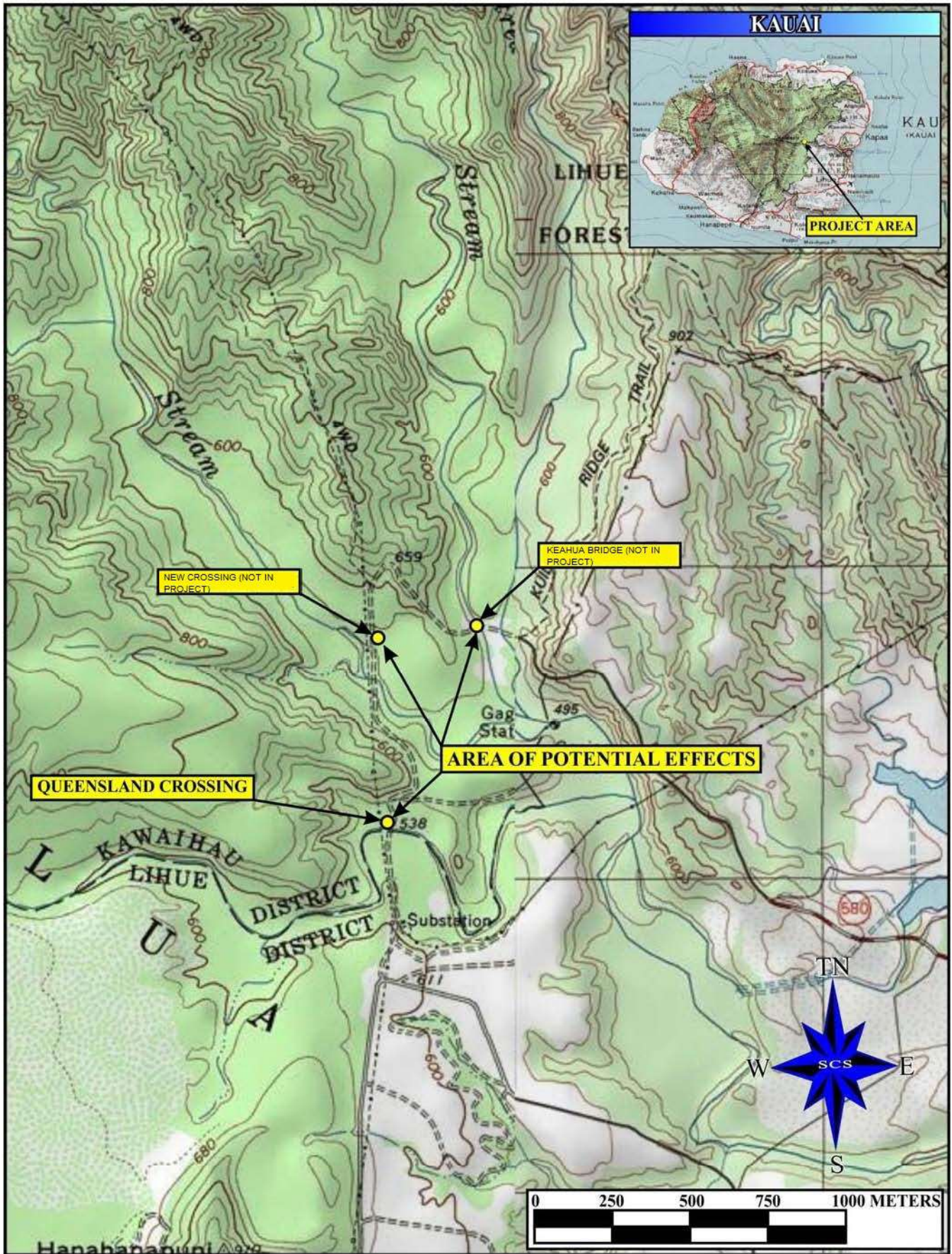
	<p><i>the alteration and modification of the equipment or facilities, including, but not limited to:“(D) Water, sewage, electrical, gas, telephone, and other essential public utility services extensions to serve such structures or facilities; accessory or appurtenant structures including garages, carports, patios, swimming pools, and fences; and, acquisition of utility easements.”</i></p> <p>PART 1</p> <p>4. Construction of drainage swales and structures and other similar surface runoff management techniques with minimal or no effect on the environment.</p> <p>PART 2</p> <p>2. Construction and location of new, small facilities or structures necessary to support or enhance safe and effective management of lands and waters, such as baseyards, caretaker's residences, work cabins and shelters, sanitation facilities, and other similar structures.</p> <p>4. Construction of roadways with distances less than 1,000 yards (excluding access roads) and walkways.</p>
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Please confirm the above exemption based on your agency’s review of the project scope. Please also advise if the project scope will require the completion of a Conservation District Use or Site Plan Approval Application.

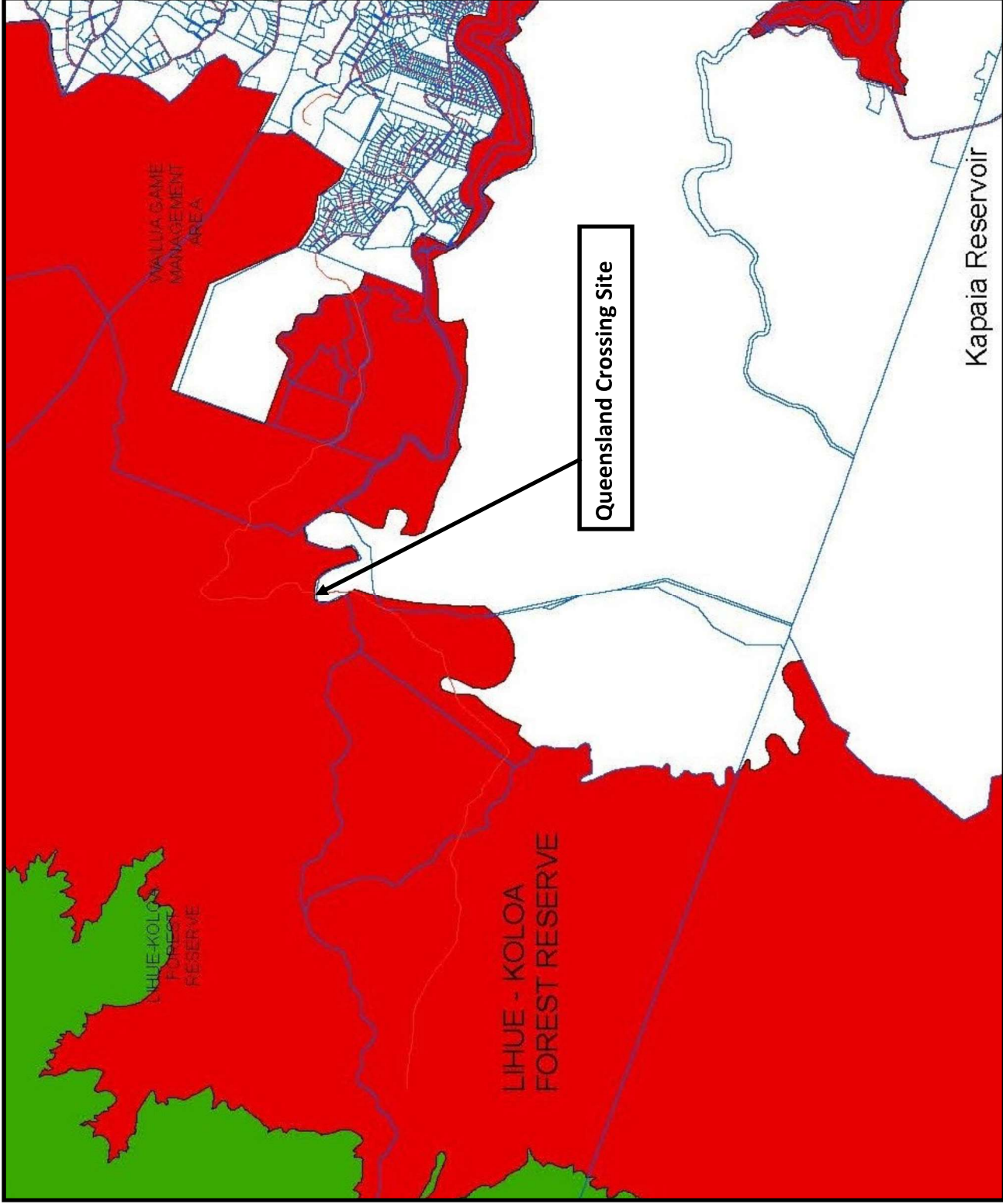
Should you have any questions, feel free to contact Frances Constantino of my staff at valerie.s.suzuki@hawaii.gov

Attachment

c: Division of Forestry and Wildlife (mapuana.r.osullivan@hawaii.gov)



LOCATION MAP



Legend

□ Kauai Tax Map Key - 2012

Conservation Subzone

- Conservation
- GENERAL
- LIMITED
- PROTECTED
- RESOURCE
- SPECIAL

STATE OF HAWAII CONSERVATION DISTRICT MAP